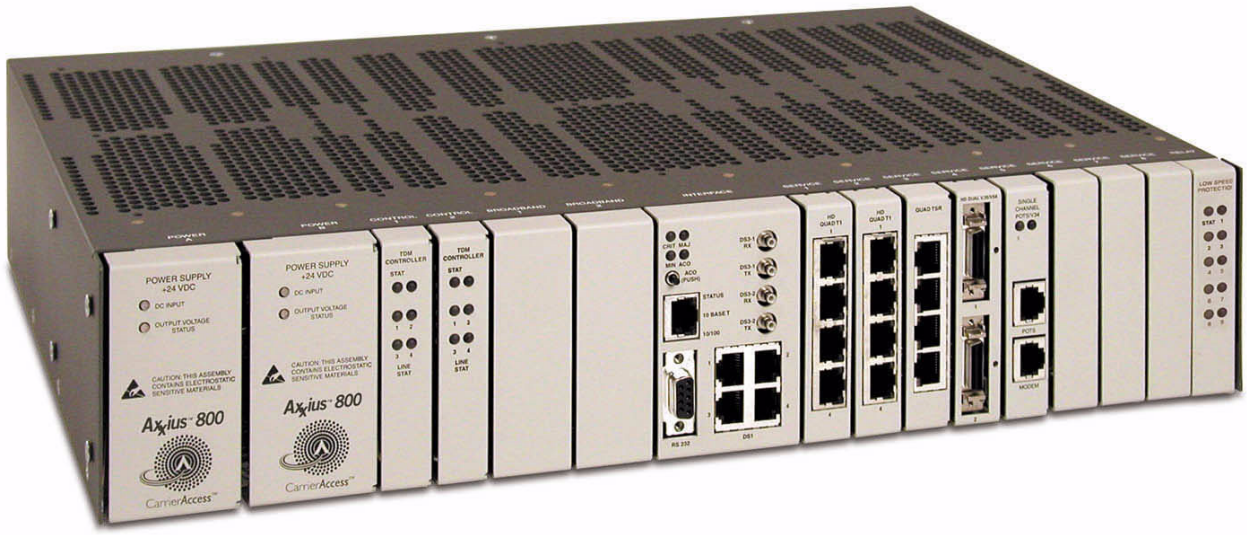
Axxius 800

USER MANUAL



Part Number: 770-0104 AG
Product Release: 2.2
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Supporting Software Version:

Axxius 800 Controller Release 2.2

Terminal Server Router Release 1.3

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PREFACE

Compliance

Safety

The Axxius 800 is certified by Underwriters Laboratories and is in compliance with UL60950, 3rd Edition; Safety of Information Technology Equipment and CSA/C22.2 No 60950.

FCC Requirements, Part 15

This equipment has been tested and found to comply with the limits for a Class A digital device pursuant to Part 15 of the Federal Communications Rules. These limits are designed to provide reasonable protection against harmful interference when equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy, and if not installed and used in accordance with the instruction manual may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference, in which case the user will be required to correct the interference at the user's own expense.

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

FCC Requirements, Part 68

This equipment complies with Part 68 of the Federal Commission Rules. On the outside surface of this equipment is a label that contains, among other information, the FCC registration number, Facility Interface Code (FIC) and Service Order Code (SOC). This information must be provided to the telephone company.

FCC Registration Number: US:2Z6MF03B800
Ringer Equivalence: 0.3B REN
Service Center in the USA: Carrier Access Corporation, 5395 Pearl Parkway, Boulder, CO 80301-2490

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The Facility Interface Code (FIC) associated with each private line application represents the type of service that will be provided by the telephone company. The following are currently registered:

Port:	FIC:	SOC:	Jack:
HD Quad T1 1.544 Mbps	04DU9-BN	6.0F	RJ48C
HD Quad T1 1.544 Mbps	04DU9-DN	6.0F	RJ48C
HD Quad T1 1.544 Mbps	04DU9-1KN	6.0F	RJ48C
HD Quad T1 1.544 Mbps	04DU9-1SN	6.0F	RJ48C
HD Quad DS1 ADPCM 1.544 Mbps	04DU9-BN	6.0F	RJ48C
HD Quad DS1 ADPCM 1.544 Mbps	04DU9-DN	6.0F	RJ48C
HD Quad DS1 ADPCM 1.544 Mbps	04DU9-1KN	6.0F	RJ48C
HD Quad DS1 ADPCM 1.544 Mbps	04DU9-1SN	6.0F	RJ48C
Front Interface T1 1.544 Mbps	04DU9-BN	6.0F	RJ48C
Front Interface T1 1.544 Mbps	04DU9-DN	6.0F	RJ48C
Front Interface T1 1.544 Mbps	04DU9-1KN	6.0F	RJ48C
Front Interface T1 1.544 Mbps	04DU9-1SN	6.0F	RJ48C
V.34 Modem Interface	02LS2	9.0F	RJ11C

An FCC-compliant telephone and modular plug is provided with this equipment. This equipment is designed to be connected to the telephone network or premises wiring using a compatible modular jack which is Part 68 Compliant. See installation instructions for details.

If this equipment causes harm to the telephone network, the telephone company will notify you in advance that temporary discontinuance of service may be required. But if advance notice is not practical, the telephone company will notify the customer as soon as possible. Also, you will be advised of your right to file a complaint with the FCC if you believe it is necessary.

The telephone company may make changes in its facilities, equipment operations, or procedures that could affect the operation of the equipment. If this happens, the telephone company will provide advance notice so that you may make necessary modifications in order to maintain uninterrupted service.

If trouble is experienced with the Axxius 800, please contact the Carrier Access Customer Support at (800) 786-9929 or (303) 442-5455. If the equipment is causing harm to the network, the telephone company may request you to remove the equipment from the network until the problem is resolved.

No repairs are to be made by you. Repairs are to be made only by Carrier Access or its licensees. Unauthorized repairs void registration and warranty.

This equipment cannot be used on public coin service provided by the telephone company. Connection to Party Line Service is subject to state tariffs. (Contact your state public utility commission, public service commission or corporation commission for information.3

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Industry Canada CS-03

Registration Number: IC: 2638A-800

”NOTICE: This equipment meets the applicable Industry Canada Terminal Equipment Technical Specifications. This is confirmed by the registration number. The abbreviation, IC, before the registration number signifies that registration was performed based on a Declaration of Conformity indicating that Industry Canada technical specifications were met. It does not imply that Industry Canada approved the equipment.”

"NOTICE: The Ringer Equivalence Number (REN) for this terminal equipment is 0.3. The REN assigned to each terminal equipment provides an indication of the maximum number of terminals allowed to be connected to a telephone interface. The termination on an interface may consist of any combination of devices subject only to the requirement that the sum of the Ringer Equivalence Numbers of all the devices does not exceed five."

Industry Canada ICES-003

English
This class A digital apparatus complies with Canadian ICES-003.

French
Cet appareil numérique de la classe A est conforme à la norme NMB-003 du Canada.

NOTE: See *Compliant Installation on page 3-2* for installation instructions to meet FCC Part 15 requirements.

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Safety Information

CAUTION! ALWAYS USE CAUTION WHEN INSTALLING TELEPHONE LINES. READ THE CAUTIONS BELOW FOR DETAILS ON SAFETY GUIDELINES TO PREVENT INJURY.

- **Never touch uninsulated telephone wires and terminals** unless the telephone line has been disconnected at the Network Interface (NI) as voltage potentials as high as 300 VAC may be present across the transmit and receive pairs.
- **Only use No. 26 AWG or larger** telecommunication line cord, to reduce the risk of fire.
- **Never install telephone wiring during a lightning storm.**
- **Never install telephone jacks in wet locations** unless the jack is specifically designed for wet locations.
- Refer to the installation section of this manual for a safe and proper installation procedure. All wiring external to this equipment should follow the current provision of the National Electrical Code.

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Notices

This manual contains important information and warnings that must be followed to ensure safe operation of the equipment.

DANGER! **A *DANGER* NOTICE INDICATES THE PRESENCE OF A HAZARD THAT CAN OR WILL CAUSE DEATH OR SEVERE PERSONAL INJURY IF THE HAZARD IS NOT AVOIDED.**

CAUTION! **A *CAUTION* NOTICE INDICATES THE POSSIBILITY OF INTERRUPTING NETWORK SERVICE IF THE HAZARD IS NOT AVOIDED.**

WARNING! **A *WARNING* NOTICE INDICATES THE POSSIBILITY OF EQUIPMENT DAMAGE IF THE HAZARD IS NOT AVOIDED.**

NOTE: A *Note* indicates information to help you understand how to perform a procedure or how the system works. Notes should be read before performing the required action.

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Electrostatic Discharge (ESD) Precautions

ESD can damage processors, circuit cards, and other electronic components. Always observe the following precautions before installing a system component.

1. Do not remove a component from its protective packaging until ready to install it.
2. Wear a wrist grounding strap and attach it to a metal part of the system unit before handling components. If a wrist strap is not available, maintain contact with the system unit throughout any procedure requiring ESD protection.

WARNING! INTEGRATED CIRCUITS (ICS) ARE EXTREMELY SUSCEPTIBLE TO ELECTROSTATIC DISCHARGE. UNLESS YOU ARE A QUALIFIED SERVICE TECHNICIAN WHO USES TOOLS AND TECHNIQUES THAT CONFORM TO ACCEPTED INDUSTRY PRACTICES, DO NOT HANDLE ICS.

The ESD warning label appears on packages and storage bags that contain static-sensitive products and components.

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Warranty

Carrier Access Corporation conditionally warrants to BUYER that PRODUCTS are free from substantial defect in material and workmanship under normal use given proper installation and maintenance for the period of five years from the date of shipment by Carrier Access Corporation.

BUYER will promptly notify Carrier Access Corporation of any defect in the PRODUCT. Carrier Access Corporation or its agent will have the right to inspect the PRODUCT or workmanship on BUYER'S or BUYER'S customer premises. Carrier Access Corporation has the option to: (a) repair, replace or service at its factory or on the premises the PRODUCT or workmanship found to be defective; or (b) credit BUYER for the PRODUCT in accordance with Carrier Access Corporation's depreciation policy. Refurbished material may be used to repair or replace the PRODUCT. PRODUCTS returned to Carrier Access Corporation for repair, replacement, or credit will be shipped prepaid to BUYER.

Limitations of Warranty & Limitation of Remedies

Correction of defects by repair, replacement, service or credit will be at Carrier Access Corporation's option and constitute fulfillment of all obligations to buyer for breach of warranty.

Carrier Access Corporation assumes no warranty liability with respect to defects in the PRODUCT caused by: (a) modification, repair, installation, operation or maintenance of the PRODUCT by anyone other than Carrier Access Corporation or its agent, except as described in Carrier Access Corporation's documentation; or (b) the negligent or other improper use of the PRODUCT; or (c) handling or transportation after title of the PRODUCT passes to BUYER.

Other manufacturer's equipment purchased by Carrier Access Corporation and resold to BUYER will be limited to that manufacture's warranty. Carrier Access Corporation assumes no warranty liability for other manufacturer's equipment furnished by BUYER.

Buyer understands and agrees as follows: the warranties in this agreement replace all other warranties, expressed or implied, and all other obligations or liabilities of Carrier Access Corporation, including any warranties of merchantability and fitness for a particular purpose. All other warranties are disclaimed and excluded by Carrier Access Corporation.

The remedies contained in this agreement will be the sole and exclusive remedies whether in contract, tort or otherwise, and Carrier Access Corporation will not be liable for injuries or damages to persons or property resulting from any case whatsoever, with the exception of injuries or damages caused by the gross negligence of Carrier Access Corporation. These limitations apply to all services, software, and products during and after the warranty period. In no event will Carrier Access Corporation be liable for any special, incidental, or consequential damages or commercial losses even if Carrier Access Corporation has been advised thereof.

No agent, distributor, or representative is authorized to make any warranties on behalf of Carrier Access Corporation or to assume for Carrier Access Corporation any other liability in connection with any of Carrier Access Corporation's PRODUCTS, Software, or Services.

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Warranty Product Returns

Before returning any equipment to Carrier Access Corporation, first contact the distributor or dealer from which you purchased the product.

A Return Material Authorization (RMA) number is required for all equipment returned to Carrier Access Corporation. Call Carrier Access Corporation Customer Support at (800) 786-9929 or (303) 442-5455 for RMA number, repair/warranty information and shipping instructions. Be prepared to provide the following information:

- Carrier Access Corporation serial number(s) from the system chassis or circuit card(s)
- Name of distributor or dealer from which you purchased the product
- Description of defect

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Glossary

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CHAPTER 1

Base Platform

In this Chapter

- Overview
- Features
- Technical Specifications
- Chassis
- Built-In Card Handles
- Management Ports
- Local and Remote Management
- Control Panel Interfaces
- Control Panel LEDs
- ACO

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Overview

The Axxius 800 Access Integration Platform solves today's problems of multiple boxes, scalability, space, power, and environmental constraints associated with delivering voice and data services. The Axxius 800 defines a new level of functionality and performance for the access needs of both wireless and wireline service providers, and enables them to groom and deliver services for more revenue at dramatically lower costs. Its versatility and scalability in a two rack unit design offers the highest density and most flexibility to meet the complex network challenges of today and tomorrow.

The Axxius 800's enclosure, commons, and many of the service cards are temperature-hardened and designed to withstand the extreme conditions found in service provider equipment locations. It is a carrier-quality platform with full redundancy to protect critical networks. The Axxius 800 Base Platform includes 1+1 Power Supply slots, 1+1 Controller card slots, 1+1 Broadband Interface slots, a Control Panel Interface card, eight universal Service card slots, and one Low-Speed Interface Protection card slot.

The rear panel of the Axxius chassis is connectorized and designed for the tight confines of cell sites, outside cabinets, collocations, or central offices. Dual-feed rear power connectors support power supply redundancy, and inputs for clocking and alarm connections are easily accessible. In addition, front RJ-48C and rear wire-wrap terminals provide easy connection points to DSX patch panels from any of the eight Service card slots.

The DS1 and DS3 Controllers manage the Service cards, providing the physical, electrical, and logical connections to deliver a complete, integrated, single-unit solution. The following are the supported Service cards:

- 8-Channel FXO Voice Service card
- Dual V.35/.54 Service card (hardened)
- ISDN BRI Service cards
- OCU-DP Service cards
- Quad DS1 ADPCM Service card (hardened)
- Quad DS1/E1 Service Card (hardened) - E1 supported in future release
- Quad T1 Service card (hardened)
- Single-Channel POTS Service card (hardened)
- Single-Channel POTS Service card with an integrated V.34 modem
- Terminal Server Router (TSR) Service card (hardened)
- Low-Speed Interface Protection card (hardened)

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The Control Panel Interface card provides front access to all the physical interfaces of the DS1 or DS3 Controller cards. It provides four RJ-48C DS1 connections when using the DS1 Controller and two sets of DS3 SMB interfaces when using the DS3 Controller. Additionally, the Control Panel Interface Card provides the RS-232 and 10/100Base-TX Ethernet management connections for system configuration and control. Status indicators are provided for critical, major, minor, and ACO alarm relay status, and an Alarm Cut Off (ACO) Switch is also provided to silence external audible alarms.

Note: In the event of a power failure to the unit (5V in the backplane), there are relays that will cut 1 to 3 and 2 to 4. These relays are hard-wired to +5V, so al long as there is power, the cut-through does not happen (there is no software control of this feature).

Features

- 24 or 48 VDC power options
- High service availability through circuit protection, redundancy, remote provisioning and hot-swappable service cards
- All cards hot-swappable
- Supports fully protected Ring, Star, and Cascade network topologies
- High interface density and versatility. 8 service slots for: T1, V.35 10/100Base-T Ethernet, RS-232, POTS, OCU-DP, FXO and ISDN BRI service cards and Terminal Server Router card for 10/100Base-TX Ethernet
- Simplified installation with front access modular or rear wire-wrap connectors
- 19 or 23 inch rack mountable, 2 RU, passively cooled
- 10 user-defined alarm inputs
- Audio and visual alarm outputs
- Primary and secondary BITS clock inputs for external timing source
- Operating temperature ranges -40 to 149 ºF (-40 to 65 ºC)

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Controllers

The Axxius 800 has two controllers available, one controller can support the system, however with two controller (same type) the system is redundant.

Dual DS3 Controller

Features two DS3 ports with integrated 3/1/0 cross-connect matrix, providing non-blocking connectivity between the DS3 Controller and any of the 8 service card slots.

Quad DS1 Controller

Features four DS1 ports with integrated CSUs and a built-in 1/0 cross-connect matrix, providing full, non-blocking connectivity between the controller and any of the 8 service card slots.

Service Cards

All Service cards are hot-swapable and can be installed in any of the 8 service slots of the Axxius 800 chassis, with the exception of the Low Speed Protection card, which has a defined slot.

FXO Service card

The FXO service card is an 8 port Foreign Exchange Office (FXO) or Dial Pulse Termination (DPT) line card. Delivers high-density provisioning of Direct Inward Dialing (DID) or FX0 telephone services from T1 access circuits.

ISDN BRI Service card

The ISDN Basic Rate Interface (BRI) service card is available in a Dual, Quad or Octal port option. The ISDN BRI service delivery interfaces enable delivery of high-density, standards based, ISDN BRI services of T1 access circuits.

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OCU-DP Service card

The OCU-DP service card is available in a Single or Quad port option. The OCU-DP interface service allows Digital Data Service (DDS) circuit terminations on the Adit 600 platform. Provides the electrical and physical termination of a 4-wire DDS baseband connection which interfaces with a remote CSU/DSU.

POTS Service card

A Single Channel POTS card provides wireless service providers a standard FXS voice circuit for communications, with the operations support group under conditions where the cell site radios are being serviced.

Quad DS1 ADPCM Service card

The 4 port T1 service card can compress and groom voice traffic, which increases bandwidth utilization and reduces costs. Using Adaptive Differential Pulse Code Modulation (ADPCM), this card compresses selected voice timeslots from one of the T1 ports.

Quad DS1/E1 and T1 Service cards

The 4 port T1 service card enables cost-effective provisioning and expansion of T1 bandwidth with full non-blocking digital cross-connection of all timeslots to any Axxius service card. E1 capability will be supported in a future release.

V.35/54 Service cards

The Dual port V.35 interface service card provides connectivity to high-speed serial synchronous Data Terminal Equipment (DTE) devices.

Terminal Server Router (TSR) Service card

The Terminal Server Router card provides all IP Router card functions and features, with the added features of a selectable four port RS-232 and 10/100Base-TX Ethernet switch with dedicated routing functionality. There is an option of this card which provides TBOS.

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Low Speed Protection card

Low speed protection provides backup circuitry for any T1 service port on any Quad T1 service card in the Axxius chassis. The Relay card provides the physical connectivity between the "Protected" T1 service port and the "Backup" T1 service port. Connectivity exists between the Quad T1 service card and the Relay card via the backplane pins only.

Power Supplies

24 VDC Power Supply

Provides the a standard +24 VDC power supply.

48 VDC I48 Power Supply

Provides the standard -48 VDC power supply.

48 VDC NI48 Power Supply

Provides non-isolated -48 volt to the backplane, to support the FXO and OCU-DP Service cards.

Technical Specifications

Platform Features

- System Controllers (1 + 1 redundancy)
- Hot-swappable manager, power, and service cards
- Power supplies (1 + 1 redundancy)
- Integrated 3/1/0 digital cross-connect
- TDM transport, Add/Drop, Drop-and-Insert
- Front and rear access for service and network interfaces

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Capacities

- 2 x Power Supply cards
- 2 x DS3 or DS1 Controller cards
- 1 x Control Panel Interface card
- 8 x universal service cards
- 36 T1 ports (8 x Quad T1 service cards + 4 on DS1 Controller)
- 1536 DS0 non-blocking cross-connect capability

Redundancy

- 1:1 Controllers (automatic switchover) for provisioning redundancy
- 1:7 T1 interface protection ratio with Low-Speed Interface Protection card
- 1 + 1 Power Supplies

Control Panel Interfaces

- 4 x RJ-48C jacks (Quad DS1 Controller)
- 4 x SMB connectors (2 TX, 2 RX) for DS3 Controller
- 1 x 10/100Base-TX Ethernet RJ-45 jack
- 1 x RS-232 DB9 female jack
- 1 x ACO switch
- Status indicators for critical, major, minor and ACO

Rear Chassis Interfaces

- 8 x 16 wire-wrap pins
- 2 x 2 pin modular plug for dual DC power feeds
- 2 x 3 wire-wrap pins for BITS clock input (primary and secondary)
- 2 x 6 pin modular receptacle for alarm relay outputs
- Audible alarm outputs (3) critical, major and minor
- Visible alarm outputs (3) critical, major and minor
- 2 x 10 pin modular receptacle for environmental monitor inputs
- 2 x 3/16 inch threaded stud for grounding

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Alarm Connectors

The alarm contact outputs are per Telcordia definitions for visible and audible. They operate per the spec with the exception that the audible outputs can be disabled with the ACO button.

- The alarm output contacts are designed for use at 48V nominal with a current draw of 0.5A maximum.
- The alarm inputs are dry contact with a current capacity of 10mA.

Network Standards

- ANSI/TIA - T1.403 ESF FDL

Management

- Craft Interface - front access from RS-232 (DB9) or 10/100Base-TX Ethernet ports
- SNMP
- Dedicated Management DS0 for remote management access

Power

- DC Power: -48 VDC or +24 VDC, 120 W rated input
- OCU-DP and FXO Service cards require -48 VDC Power Supply
- Dual-feed power inputs located on rear panel

Physical Information

- Dimensions: 3.5 in. (H-2 RU) x 17.25 in. (W) x 12.5 in. (D)
  8.9 cm (H) x 43.8 cm (W) x 31.75 cm (D)
- Weight: approximately 30 lbs. (13.6 kg) fully loaded
- Rack mount, 19 or 23 inch

Environment

See *Installation Environment on page 2-3*

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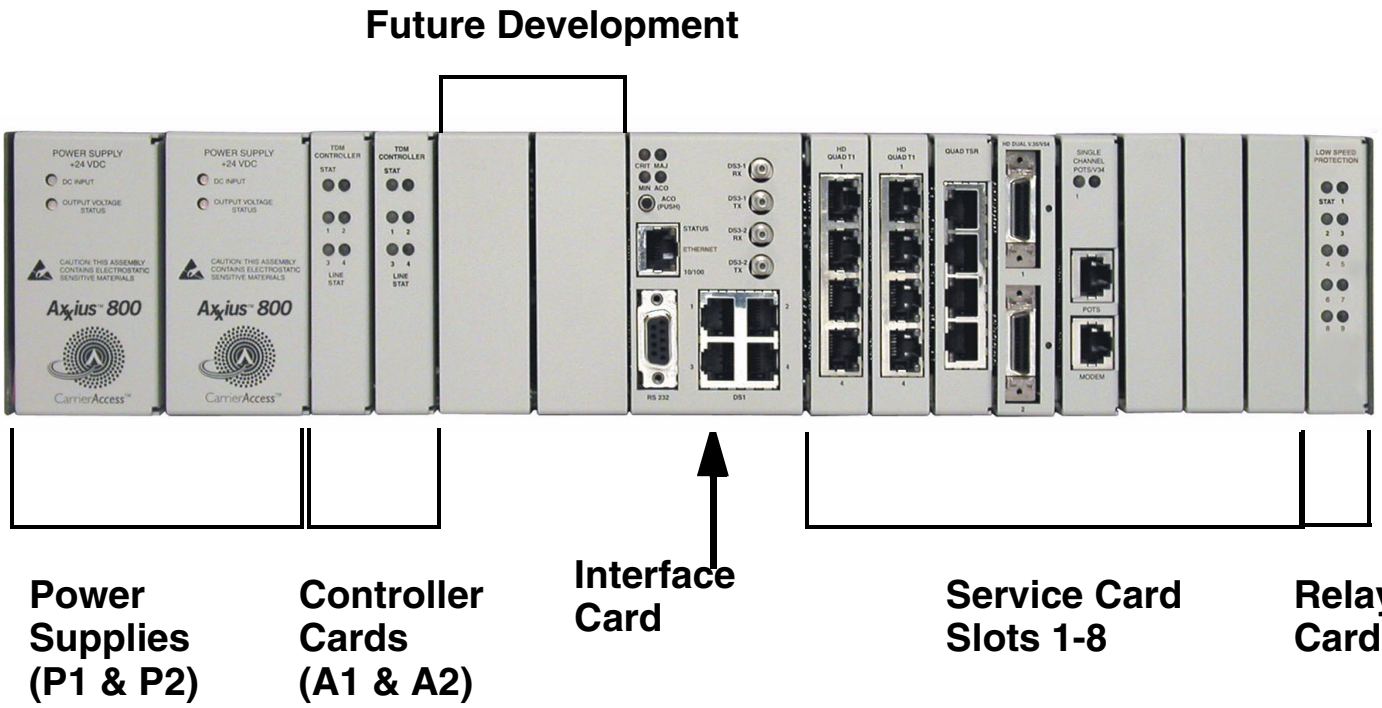
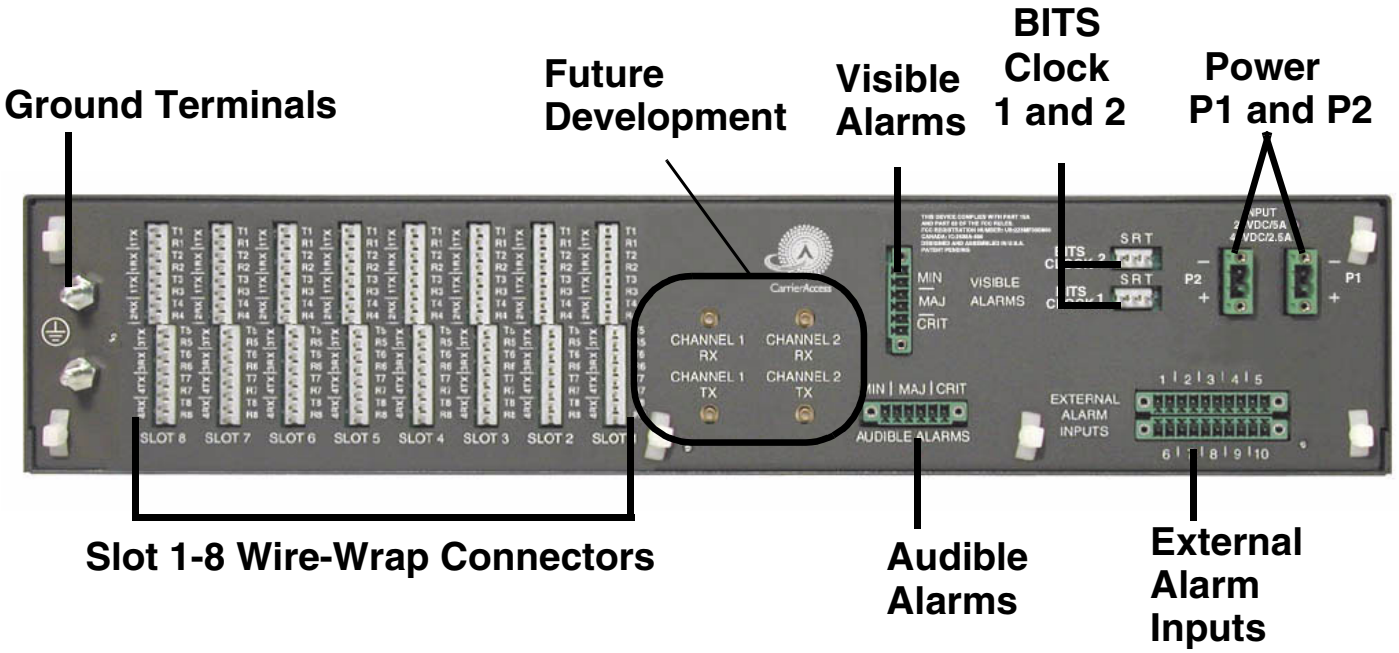
Chassis





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Built-In Card Handles

Several of the cards for the Axxius 800 are designed with a handle built into the faceplate to assist in the removal of the card from the chassis. This handle slides out away from the unit, creating a handle for a more effective grip. The Controller cards and the Single Channel POTS card have this feature.

Management Ports

RS-232 Craft Port

The Axxius 800 contains an RS-232 craft port for connection through any VT100 terminal, PC, or modem for remote management using the Command Line Interface.

10/100Base-T Ethernet Port

A 10/100Base-T Ethernet Port available for management on the Controller card.

Local and Remote Management

The Controller cards have several local and remote management options available. Front-panel LEDs quickly communicate alarm, system and line status. The cards can be configured and managed locally through the RS-232 or Ethernet management connections on the Interface card using a Command Line Interface (CLI).

A number of remote management options are available to reduce truck roll costs for most maintenance and troubleshooting activities. The in-band DS0 management channel on the controller delivers 64 Kbps remote access to the Axxius 800 without incurring additional facilities costs. Alternatively, as separate Ethernet facility can be deployed to support out-of-band SNMP network management, and the controller can also be accessed through the V.34 dial-in modem connection from the Single Channel POTS with V.34 Modem Service card. Remote configuration, monitoring, maintenance, and troubleshooting tasks are further simplified from the central Network Operation Center (NOC) using the graphical interfaces of the NetworkValet EMS.

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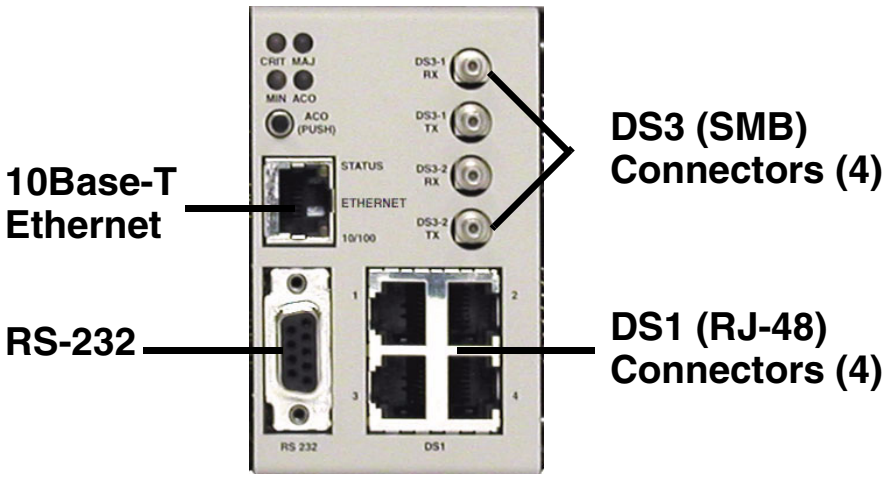
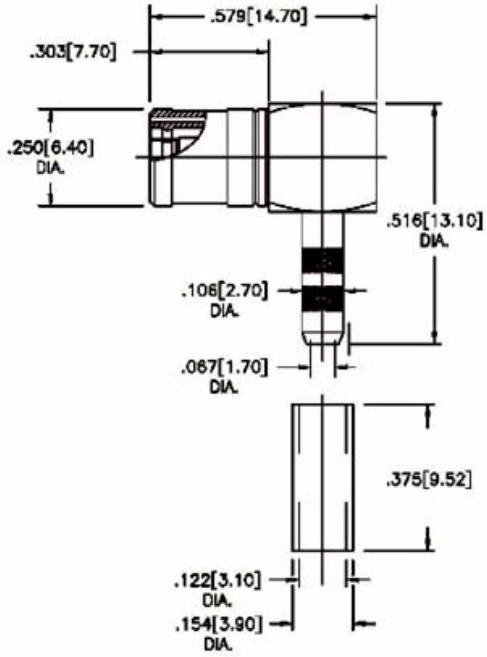
Control Panel Interfaces



SMB connector (female)

The recommended mate for the SMB connector is an SMB right angle crimp connector.



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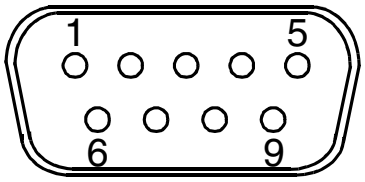
RS-232 Craft Port (Female DB-9)

The RS-232 craft port connects via a female DB-9 connector on the Axxius 800.



The pinouts are as follows:

Pin Number	Direction	Description
1	Outbound	Carrier Detect
2	Outbound	Receive Data
3	Inbound	Transmit Data
4	Inbound	Data Terminal Ready
5		Signal Ground
6	Outbound	Data Set Ready
7	Inbound	Request to Send
8	Outbound	Clear to Send
9		Not Connected

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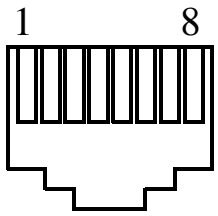
DS1 Connection Ports



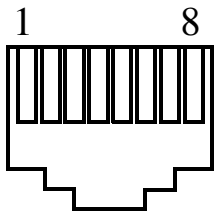
The DS1 connection ports are each equipped with a standard RJ-28C (female) on the Axxius 800 unit.

The pinouts are as follows:

DS1 (RJ-48C)

Pin	Name	Description
1	Receive Ring	Receive from DS1 network
2	Receive Tip	Receive from DS1 network
3	N/C	Not connected
4	Transmit Ring	To DS1 network
5	Transmit Tip	To DS1 network
6 -8	N/C	Not connected

10/100Base-T Ethernet



The 10/100Base-T Ethernet (female) port to connect to a remote management tool such as Telnet or an SNMP-based Network Management System.

The pinouts are as follows:

Ethernet (RJ-45)

Pin	Name	Description
1	Receive +	Receive from network
2	Receive -	Receive from network
3	Transmit +	Transmit to network
4	N/C	Not connected
5	N/C	Not connected
6	Transmit -	Transmit to network
7 - 8	N/C	Not connected

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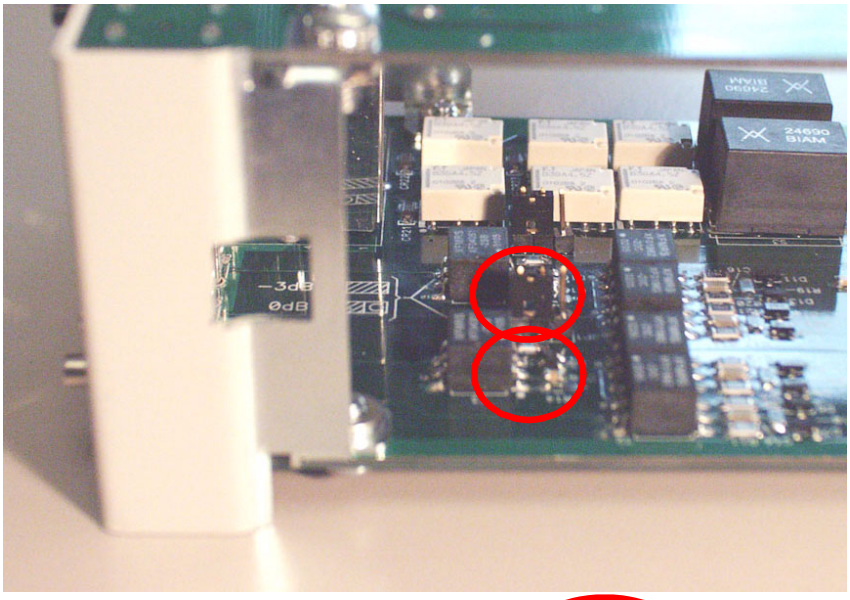
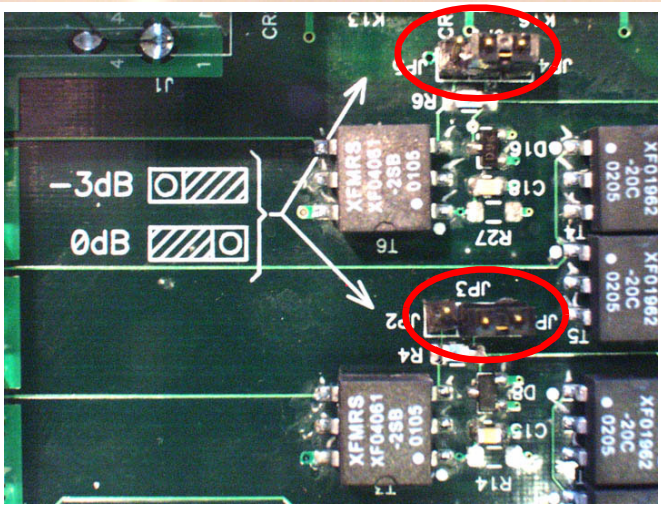
Control Panel Interface Card Jumpers

The Control Panel Interface card is provided with a jumper that allows the user to put a -3 dB pad in the transmit DS3 signal path to lower the output to a shorter line length. This prevents errors when working with very short cables.





There is a simple drawing to assist in setting the Control Panel Interface jumpers. The jumpers in the second graphic are set to the position farthest from the faceplate, they are set to -3dB.

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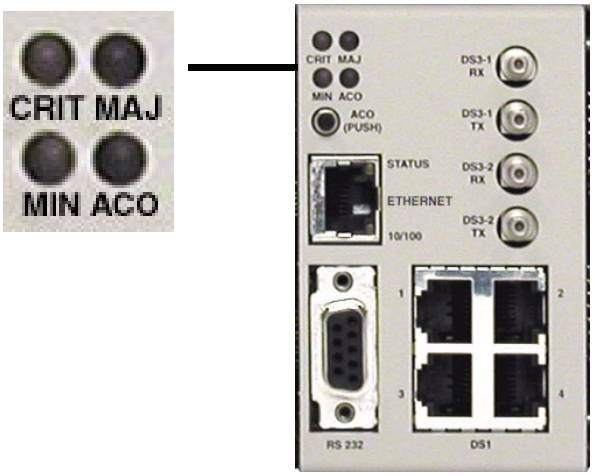
Control Panel LEDs

Alarm LEDs



LED	State	Description
CRITICAL	Off	No critical alarms present
	Red	Critical alarms present
MAJOR	Off	No major alarms present
	Red	Major alarm present
MINOR	Off	No minor alarms present
	Red	Minor alarms present
ACO	Off	Normal mode. No alarms are being suppressed.
	Red	Alarm cutoff active. One or more active alarms suppressed.

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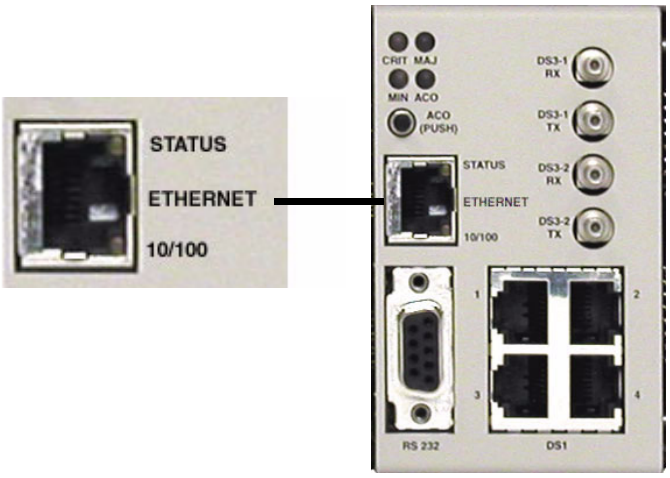
Ethernet LEDs



LED	State	Description
STATUS	Off	Link Down
	Green	Link Up
	Flashing Green	Traffic on Link

When Status LED is on or flashing:

LED	State	Description
10/100	Off	Link is 10 Mb
	Green	Link is 100 Mb

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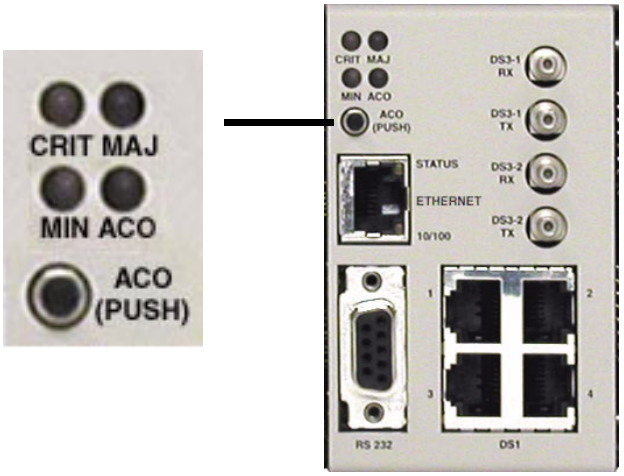
ACO

The Alarm Cutoff feature permits the operator to temporarily silence the alarm outputs while testing and repairing the Axxius 800. ACO does not stop alarm messages.

Pressing the ACO pushbutton switch disables the alarm relays and lights the ACO status LED. This keeps the relay contacts open on the Alarm Output connector. If another alarm occurs, the alarm relays will be enabled again and the ACO status LED will go off.

Alarm Cutoff disables the following signals on the Alarm Output connector:

- Critical alarm
- Major alarm
- Minor alarm



The operator also has the option of using the CLI command **aco**, see *aco (Alarm Cut Off) on page 5-5.*

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CHAPTER 2

Physical Installation

In this Chapter

- Unpacking and Inspection
- Installation Environment
- Assembly of Axxius 800
- Rack Mounting

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Unpacking and Inspection

WARNING! **OBSERVE PRECAUTIONS FOR HANDLING ELECTROSTATIC DEVICES.**

1. Inspect containers for damage during shipment. Report any damage to the freight carrier for possible insurance claims.
2. Compare packing list with office records. Report any discrepancies to the office.
3. Open shipping containers, be careful not to damage contents.
4. Inspect contents and report any damage.
5. If equipment must be returned for any reason, carefully repack equipment in the original shipping container with original packing materials if possible.
6. If equipment is to be installed later, replace equipment in original shipping container and store in a safe place until ready to install.

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Installation Environment

The environment in which you are installing the Axxius 800 must meet the following conditions:

DANGER! RESTRICTED ACCESS LOCATION FOR ACCESS 800: ACCESS CAN ONLY BE GAINED BY SERVICE PERSONNEL OR USERS WHO HAVE BEEN INSTRUCTED ABOUT THE POTENTIAL SAFETY HAZARDS THAT EXIST. ACCESS CAN ONLY BE GAINED TO THE EQUIPMENT LOCATION BY THE USE OF A TOOL OR LOCK AND KEY. TAKE PRECAUTIONS WHEN INSTALLING/SERVICING THE EQUIPMENT. HAZARDOUS ENERGY LEVELS EXIST ON THE POWER SUPPLY. BARE TELECOMMUNICATION NETWORK WIRING IS EXPOSED ON THE REAR PANEL. DISCONNECT FROM NETWORK BEFORE INSTALLING WIRE-WRAP CONNECTIONS.

NOTE: Installation of unit in Operator Access Locations is possible for 48V powered units under certain circumstances. Please contact Customer Service for information on the Axxius DC Input Shroud Kit P/N 790-0027.

- Operating temperature range: -40° to 149° F (-40° to 65° C)
  *please see items following that do not operate within this range
- V.34 modem operating temperature range: 32° to 149° F (0° to 65° C)
- FXO, ISDN BRI, and OCU-DP service cards operating temperature range: 32° to 104° F (0° to 40° C)
- Storage temperature range: -40° to 158° F (-40° to 70° C)
- Cooling method is by free air convection
- Maximum operating altitude: 10,000 ft. (3,048 m)
- Minimum operating altitude: 197 ft. (60 m) below sea level
- Maximum non-operating altitude: 40,000 ft. (12,192 m)
- Relative humidity (non-condensing) range: 0 to 95%

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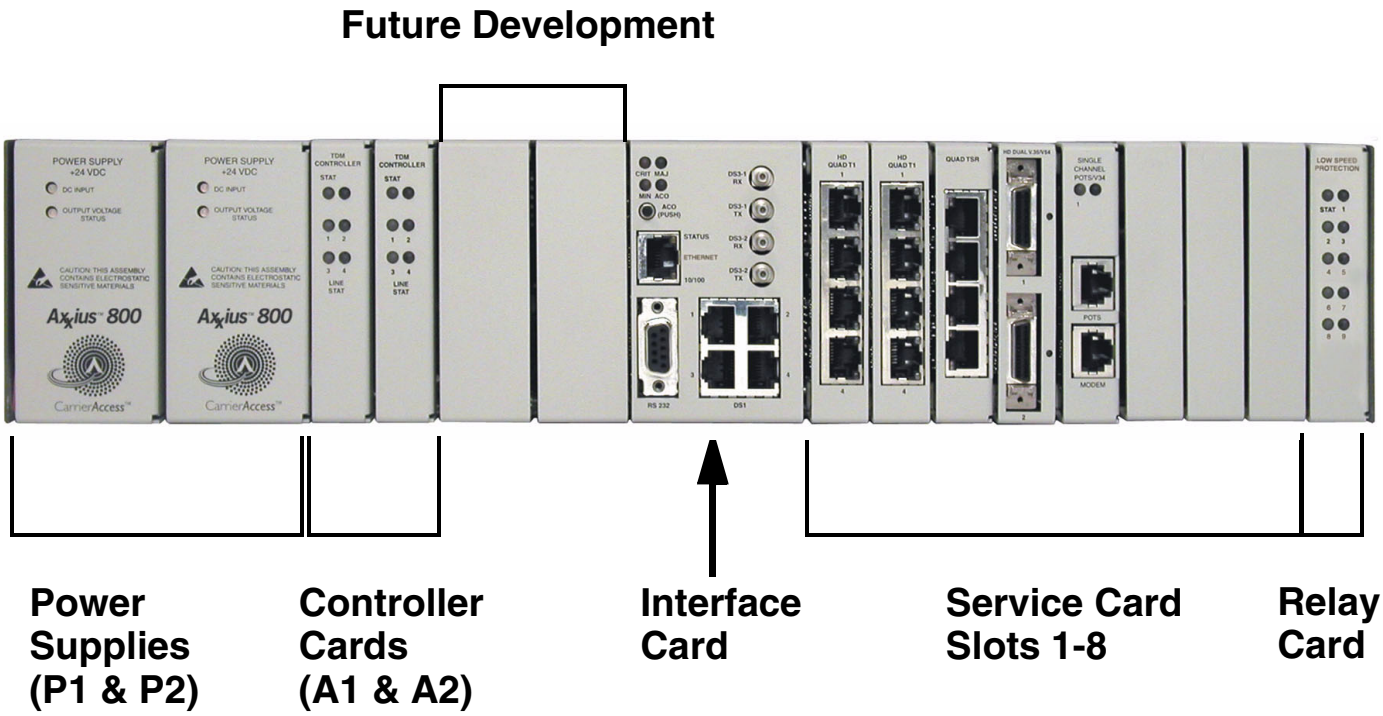
Assembly of Axxius 800

The cards should be positioned according to the following guidelines:

- Power Supply(s) 24 or 48 VDC
  Single Power Supply - slot Power 1 **or** Power 2
  Dual Power Supplies - slot Power 1 and Power 2
- Controller card(s) DS1 or DS3
  Single controller card - slot A1 **or** A2
  Dual controller cards - slot A1 and A2
- Interface card
  The Interface card is designed with two boards that follow a single guide.
- Service Cards can be in any slot 1 through 8.
  Note: Cards that use the front cable connections should be loaded from Slot 8 to 1. This will minimize card access issues due to cable interference.
- Relay Card in the Relay slot.
- Always install blank faceplates in any unused slots.



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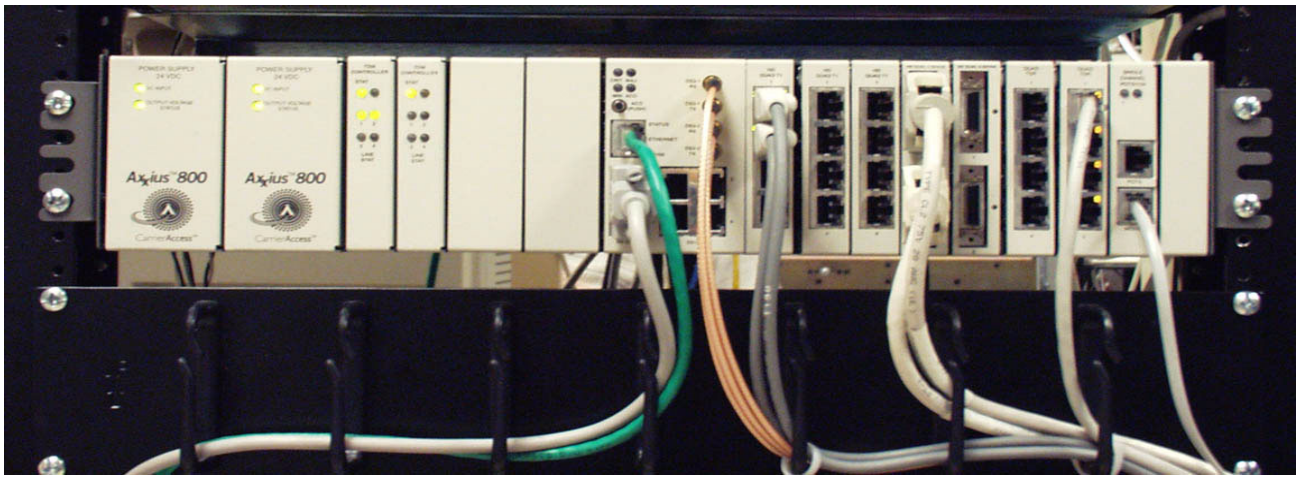
Rack Mounting

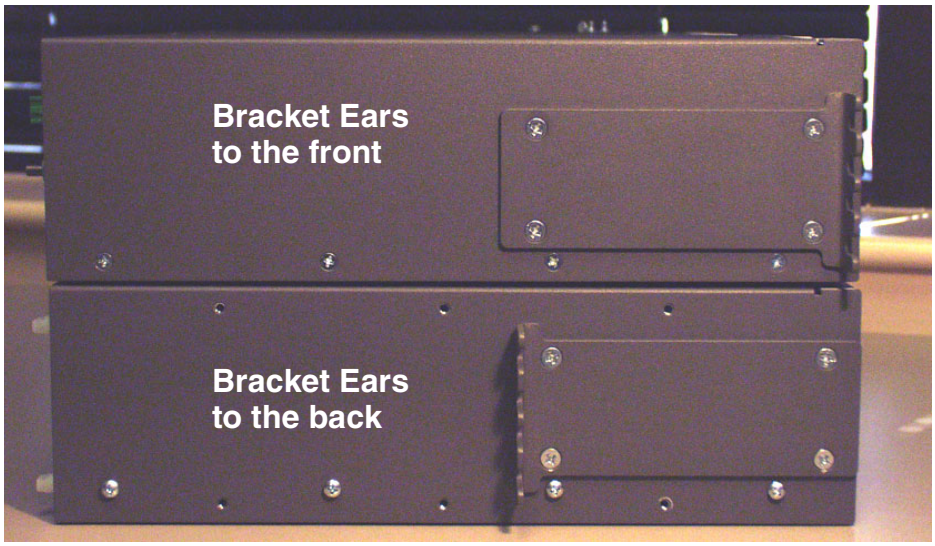
The Axxius 800 can be mounted on a 19 or 23 inch rack with Carrier Access mounting brackets.

NOTE: The Axxius 800 requires at least 3/4 inches of free air space above and below the chassis (approx 1/2 RU) for air circulation.

Always leave at least 14" clearance in front of the unit, to add and remove cards.



Axxius 800 mounted to a 19" rack with mounting brackets



Axxius Front

Depending on the customer needs the mounting brackets can be mounted with fingers to the front or to the back of the unit

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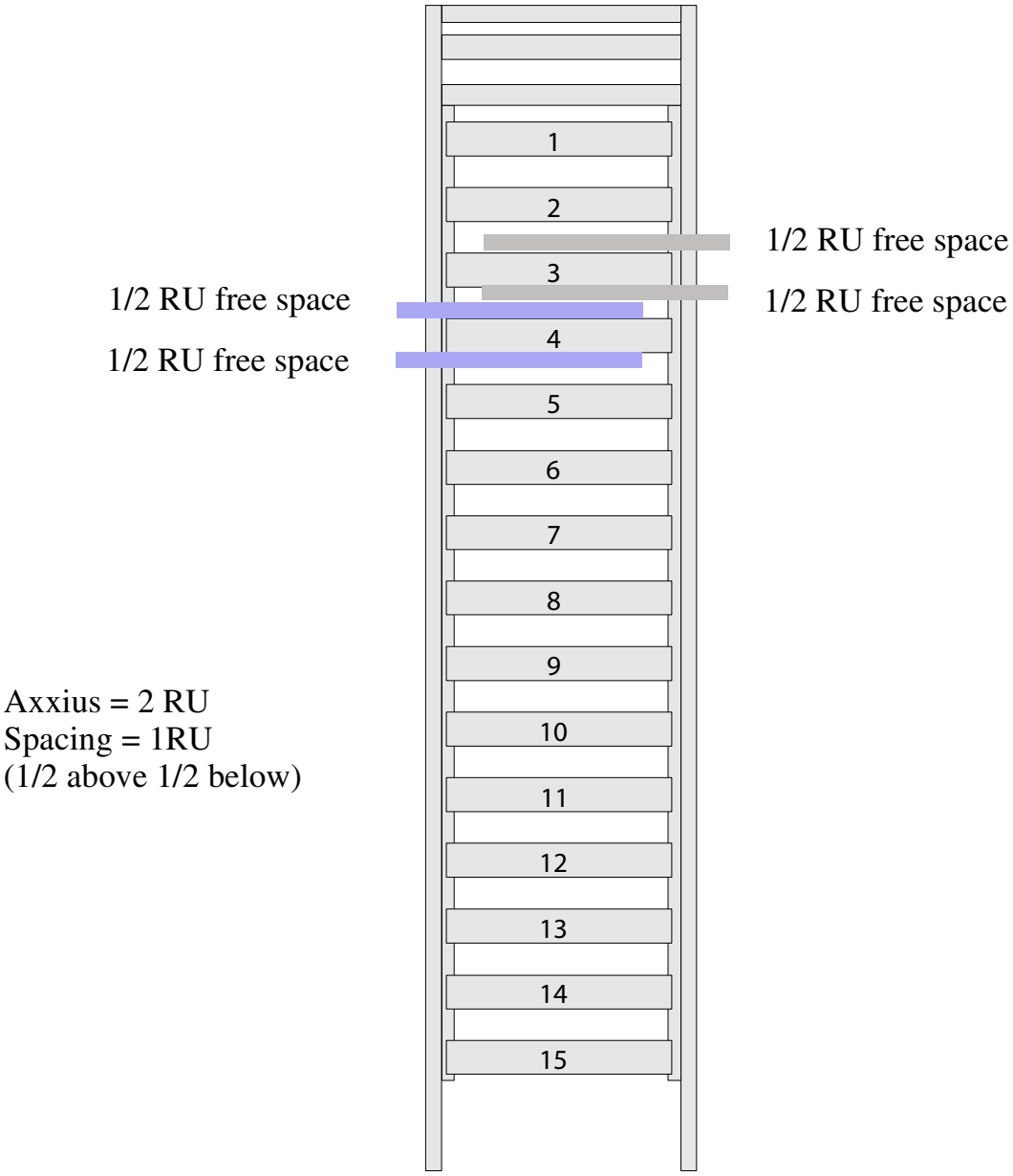
To maintain proper convection cooling, maintain at least 1/2 RU between the Axxius and any other equipment (each Axxius occupies 3 RU of rack space). Therefore, if one Axxius is mounted above another Axxius, then there would be a total of 1 RU between them (1/2 RU above the lower unit and 1/2 RU below the upper unit).

Using the 1/2 RU airspace guideline, up to 15 Axxius 800 units may be installed in a 7’ equipment rack.



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CHAPTER 3

Electrical Installation and Cabling

In this Chapter

- Compliant Installation
- Chassis Connections
- Power Connections
- External Alarm Inputs
- Visible and Audible Alarms
- BITS Clock 1/BITS Clock 2
- Slot (1-8) Wire-Wrap Connectors

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Compliant Installation

WARNING! **ALL TELECOMMUNICATION NETWORK CONNECTIONS MUST USE MINIMUM 26 AWG WIRE.**

1. Mount unit in an area that meets Environment conditions, see *Installation Environment on page 2-3*.
2. Unit should have power supply(s), controller(s) and Interface cards installed before power up.

NOTE: All cards (power supplies, controllers, interface, relay and service) slide into the unit in the same manner. There are guides for each slot (top and bottom), which the card follows until it is firmly seated into the backplane.

3. Ground the system, secure the ground lugs to the terminals using the nuts provided. Attach #6 or #8 AWG copper wire to the terminal.
4. Install service cards.
5. Install blank faceplates in any slot that is not occupied.
6. Connect BITS Clock 1 and/or 2
7. Connect Alarming
8. Secure the power cable and the ground cable with a plastic tie (not included). Keep these cables separate from the signal cables.
9. Terminate each signal cable to its appropriate connector.
10. Secure the signal cables using the small holes along the bottom of the rack and plastic ties (not included).
11. Plug in power, to the system, apply the appropriate power for the installed Power Supply(s)

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Ferrite Beads

To be compliant with FCC Part 15 EMI limits with the Quad DS1 ADPCM service card installed:

- Route alarm cables separate from the rear panel tip/ring cabling (wire wrap pins).
- Install ferrite bead accompanying this card on the visible, audible and environmental input alarm cable bundle

Ferrite beads shipped with Quad DS1 ADPCM card:

Ferrite Provided	Part Number	Intended For
1 large	P/N 010-0051	Alarm cable

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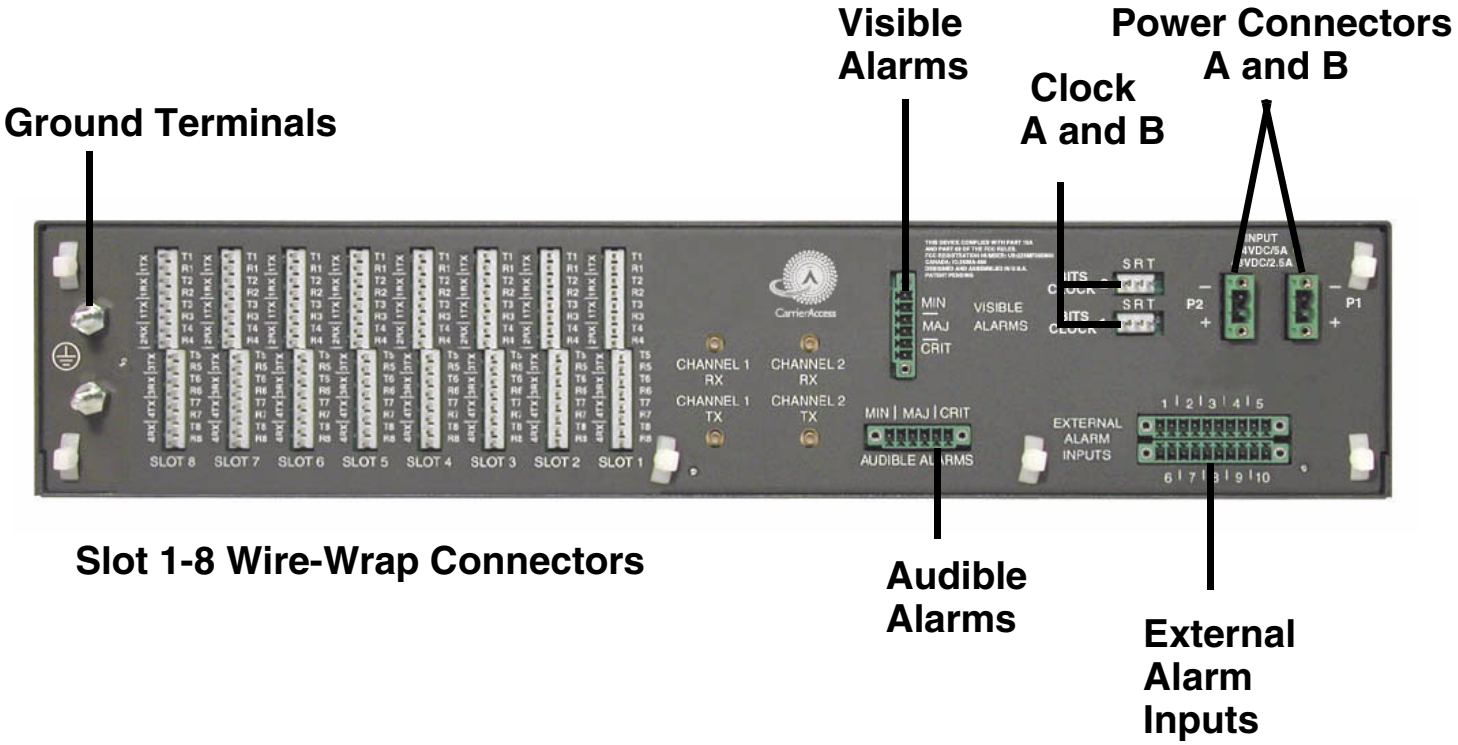
Chassis Connections

The following illustrations show all connectors on the rear, as well as the front (interface card) of the Axxius 800.



Back of the Axxius 800:

- Audible Alarms
- External Alarm Inputs
- Visible Alarms
- Input (power, P1 and P2)
- Bits Clock 1 and 2
- Wire-Wrap Connectors (slots 1-8)
- Ground Lugs

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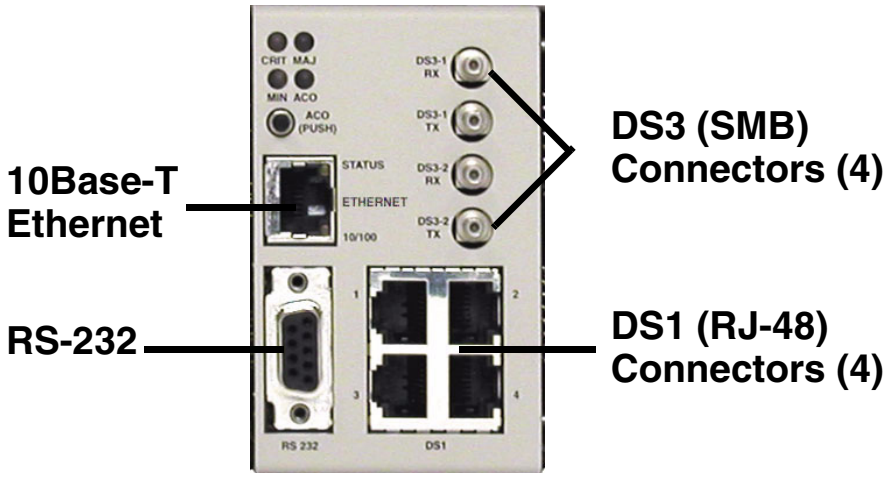

Front of the Axxius 800 - Interface Card

- 10Base-T Ethernet (RJ-45)
- RS-232 Craft Port
- DS3-1 and 2 Transmit and Receive connectors (SMB)
- DS1 (1-4) connectors (RJ-48)

For information on this card and all connectors see *Control Panel Interfaces on page 1-11.*

CAUTION! THE AXXIUS 800 CONTAINS CIRCUIT CARDS AND COMPONENTS THAT ARE SUBJECT TO DAMAGE BY ELECTROSTATIC DISCHARGE (ESD). ALWAYS FOLLOW THE *ELECTROSTATIC DISCHARGE (ESD) PRECAUTIONS, ON PAGE XXII.*

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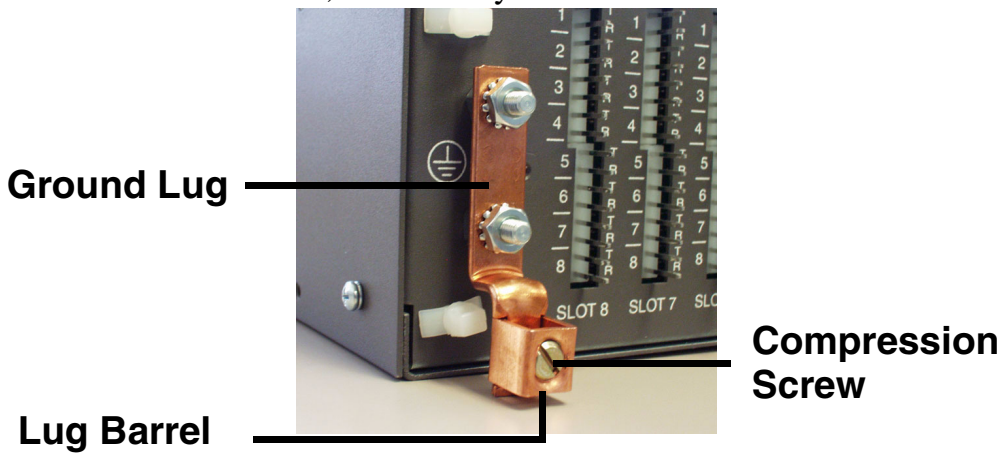
Chassis Ground Connector

Ground Terminals

1. Route wire (#6 or #8 AWG copper) from building ground to lug on Axxius 800.
2. Strip insulation off wire end, if necessary.



3. Loosen compression screw until opening is large enough to accept ground wire.
4. Insert ground wire into lug barrel, beneath compression plate and tighten compression screw.
5. Attach ground lug to chassis

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Power Connections

There are three power supplies available with the Axxius 800; 24 VDC and 48 VDC and 48 VDC NI, all use this connector. The Axxius 800 supports a redundant power system, therefore there is INPUT (power) P1 and P2.

Input Power

Power Supply	Rated Amperage	Recommended External Input Fuse
24 VDC	5 Amp	7 Amp
48 VDC/48 VDC NI	2.5 Amp	3.5 Amp

A separate fuse should be used for each DC input

NOTE: If two power supplies are installed into the system they MUST be of the same type (24 VDC, 48 VDC or 48 VDC NI).

Wire each connector to a power source:

1. Ensure that no power is present on the two wires to be connected.

DANGER! POSSIBLE SHOCK HAZARD EXISTS, PLEASE FOLLOW INSTRUCTIONS CAREFULLY.

2. Strip the two wires from the power source so that approximately 5/16 inch of bare wire is exposed. 16 or 18 AWG insulated copper wire is recommended for power connections.
3. Insert the Battery Return and DC wires into the appropriate square holes, one at a time.
4. Tighten screws to clamp wires.

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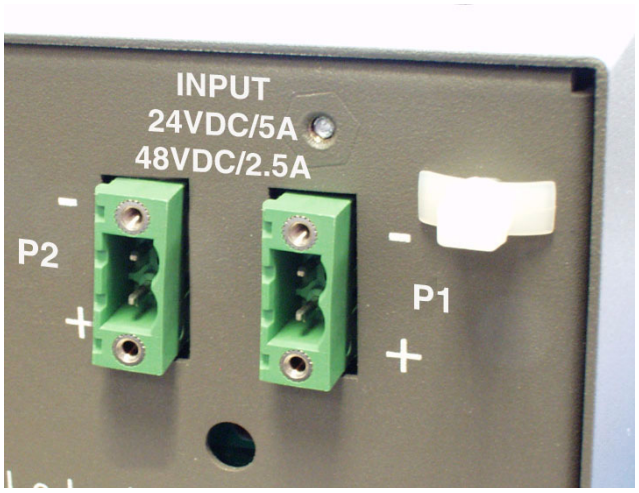
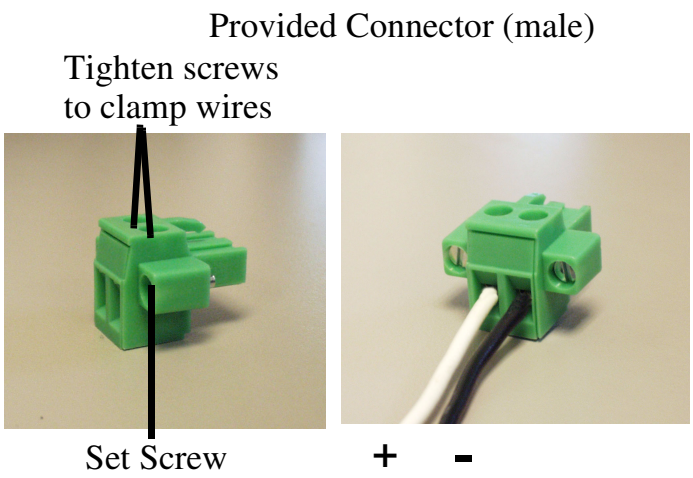
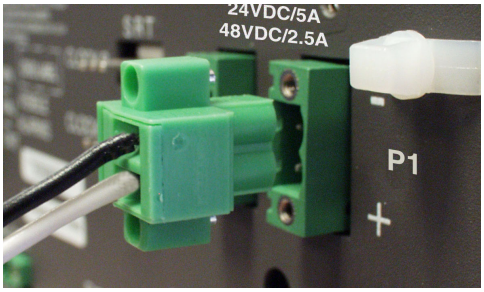
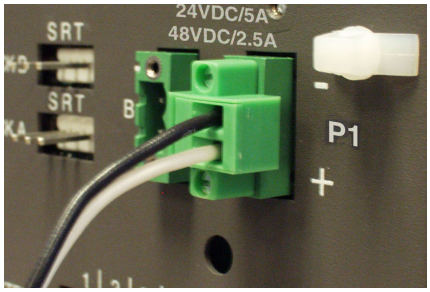
5. Ensure that no bare wire shows after the wires are installed.





6. Plug connector in the INPUT (power) connector, as seen in the graphic and secure with set screws.





7. Apply power to connector.
8. Verify with voltmeter that voltage is correct and polarity is correct.
9. Plug connector(s) into the Axxius 800.
10. A green light should appear on the DC Input LED on the front of the Power Supply.

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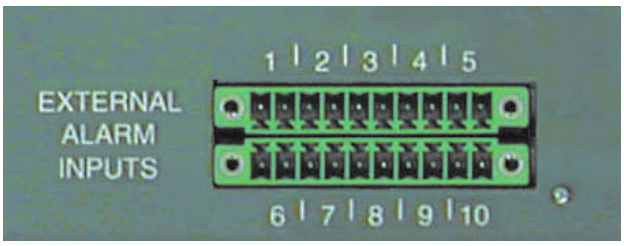
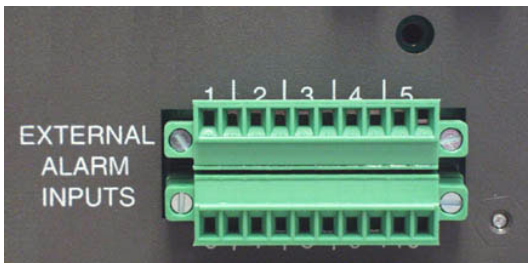
External Alarm Inputs

The external alarm input connector supports 10 alarm inputs and is composed of two 10-pin connectors (two input pairs for each).

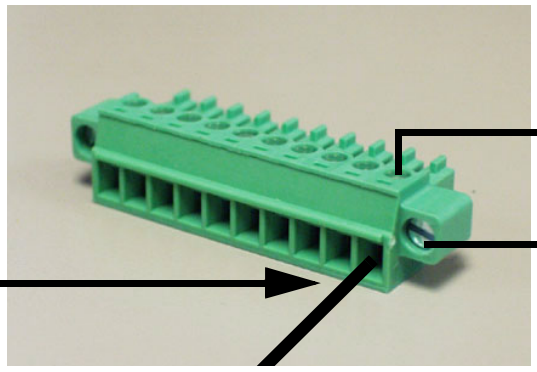
1. Strip wire so that approximately 5/16 of bare wire is exposed.



back of Axxius



Connector plugged into Axxius



2. Insert wire into opening and tighten screw to clamp wire.
3. Ensure that no bare wire shows after the wires are installed.
4. Plug connector in the EXTERNAL ALARMS INPUTS connector, as seen in the graphic above and secure with set screws.

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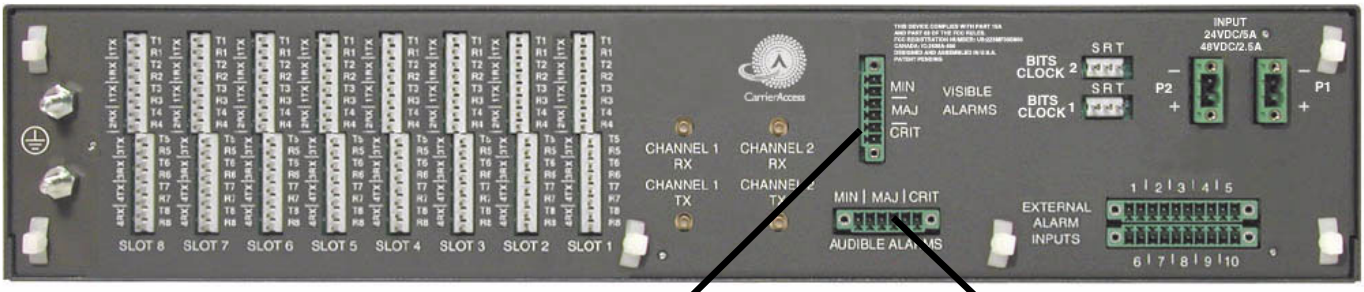
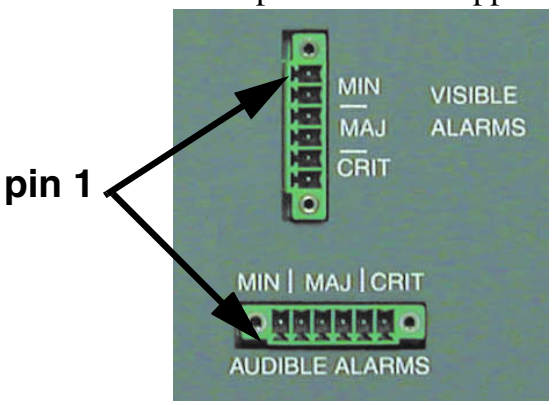
Visible and Audible Alarms

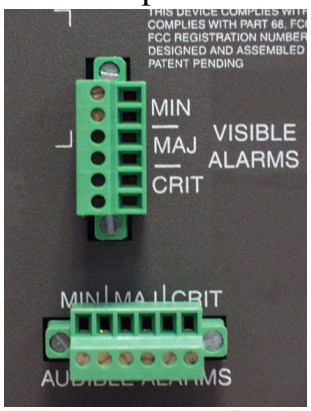
The external alarm connectors are six-pin connectors with two output pairs for each alarm level (pins 1 & 2 for minor, pins 3 & 4 for major and 5 & 6 for critical alarms).



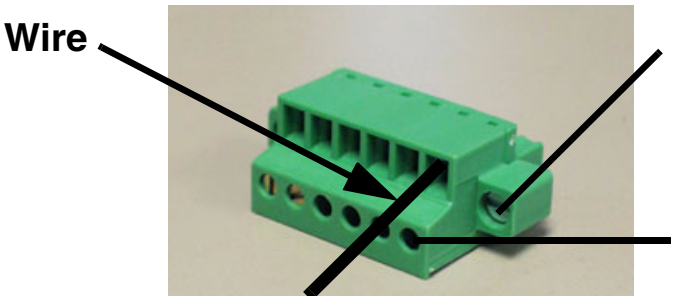
1. Strip wire so that approximately 5/16 of bare wire is exposed.



back of Axxius



Connectors plugged into Axxius



2. Insert wire into opening and tighten screw to clamp wire.
3. Ensure that no bare wire shows after the wires are installed.
4. Plug connector in the AUDIBLE ALARMS or VISIBLE ALARMS connector, as seen in the graphic above and secure with set screws.

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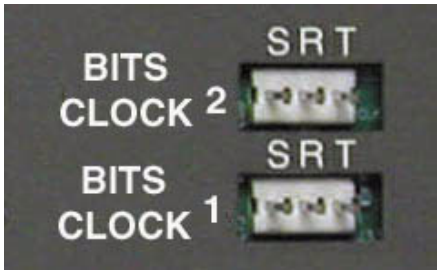
BITS Clock 1/BITS Clock 2

The external alarm connectors are three-pin wire-wrap connectors. One for each, Tip (T), Ring (R) and Shield (S). Tip and Ring are the two connections for the 100 ohm differential signal to the box. Shield is for grounding the shield of the clock cable to the Axxius. If the customer is not using shielded cable, then only the Tip and Ring is connected.

Bits Clock 1 and 2



back of Axxius

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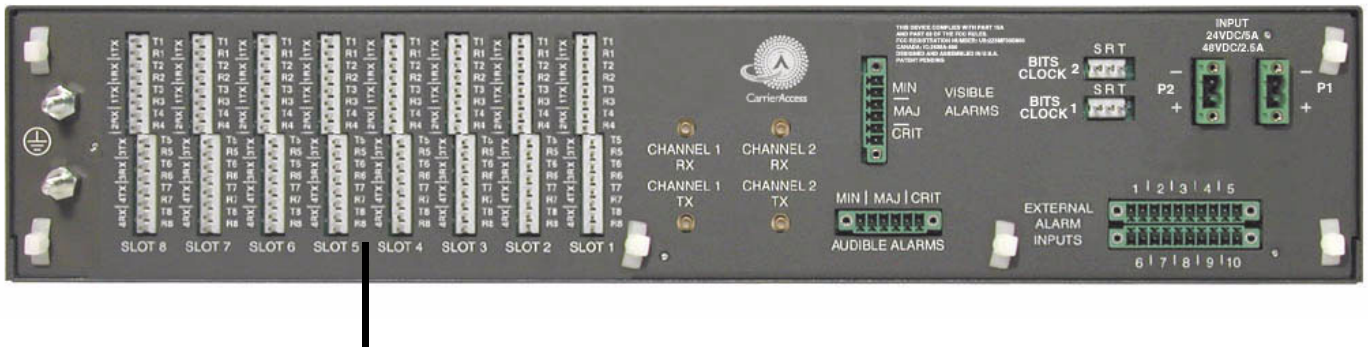
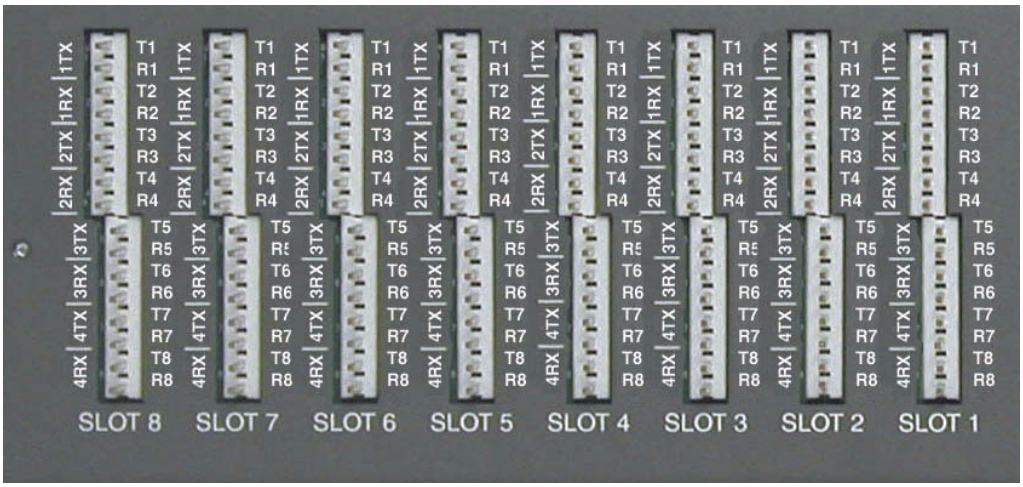
Slot (1-8) Wire-Wrap Connectors

The Axxius 800 provides wire-wrap connectors for each slot (1-8) of the unit. Pinouts are clearly labeled with the pins.

CAUTION! **DISCONNECT FROM NETWORK BEFORE INSTALLING WIRE-WRAP CONNECTIONS.**



Wire-Wrap Connectors



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Wire-Wrap Pinout for 4 Wire Services

Wire-Wrap Pins	T1	Name	Description
1TX	Port 1	Transmit Ring	To DS1 network
		Transmit Tip	To DS1 network
1RX		Receive Ring	Receive from DS1 network
		Receive Tip	Receive from DS1 network
2TX	Port 2	Transmit Ring	To DS1 network
		Transmit Tip	To DS1 network
2RX		Receive Ring	Receive from DS1 network
		Receive Tip	Receive from DS1 network
3TX	Port 3	Transmit Ring	To DS1 network
		Transmit Tip	To DS1 network
3RX		Receive Ring	Receive from DS1 network
		Receive Tip	Receive from DS1 network
4TX	Port 4	Transmit Ring	To DS1 network
		Transmit Tip	To DS1 network
4RX		Receive Ring	Receive from DS1 network
		Receive Tip	Receive from DS1 network

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Wire-Wrap Pinout 2 Wire Services

Wire-Wrap Pins	Description
T1	Channel 1 Tip
R1	Channel 1 Ring
T2	Channel 2 Tip
R2	Channel 2 Ring
T3	Channel 3 Tip
R3	Channel 3 Ring
T4	Channel 4 Tip
R4	Channel 4 Ring
T5	Channel 5 Tip
R5	Channel 5 Ring
T6	Channel 6 Tip
R6	Channel 6 Ring
T7	Channel 7 Tip
R7	Channel 7 Ring
T8	Channel 8 Tip
R8	Channel 8 Ring

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Standard Telco Color Code

Circuit connections are made at the wire-wrap connectors. The pinouts are as follows:

Pair	Pin Location	Function	Color Code
1	26 1	Tip Channel 1 Ring Channel 1	White/Blue Blue/White
2	27 2	Tip Channel 2 Ring Channel 2	White/Orange Orange/White
3	28 3	Tip Channel 3 Ring Channel 3	White/Green Green/White
4	29 4	Tip Channel 4 Ring Channel 4	White/Brown Brown/White
5	30 5	Tip Channel 5 Ring Channel 5	White/Slate Slate/White
6	31 6	Tip Channel 6 Ring Channel 6	Red/Blue Blue/Red
7	32 7	Tip Channel 7 Ring Channel 7	Red/Orange Orange/Red
8	33 8	Tip Channel 8 Ring Channel 8	Red/Green Green/Red
9	34 9	Tip Channel 9 Ring Channel 9	Red/Brown Brown/Red
10	35 10	Tip Channel 10 Ring Channel 10	Red/Slate Slate/Red
11	36 11	Tip Channel 11 Ring Channel 11	Black/Blue Blue/Black
12	37 12	Tip Channel 12 Ring Channel 12	Black/Orange Orange/Black
13	38 13	Tip Channel 13 Ring Channel 13	Black/Green Green/Black
14	39 14	Tip Channel 14 Ring Channel 14	Black/Brown Brown/Black

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Pair	Pin Location	Function	Color Code
15	40 15	Tip Channel 15 Ring Channel 15	Black/Slate Slate/Black
16	41 16	Tip Channel 16 Ring Channel 16	Yellow/Blue Blue/Yellow
17	42 17	Tip Channel 17 Ring Channel 17	Yellow/Orange Orange/Yellow
18	43 18	Tip Channel 18 Ring Channel 18	Yellow/Green Green/Yellow
19	44 19	Tip Channel 19 Ring Channel 19	Yellow/Brown Brown/Yellow
20	45 20	Tip Channel 20 Ring Channel 20	Yellow/Slate Slate/Yellow
21	46 21	Tip Channel 21 Ring Channel 21	Violet/Blue Blue/Violet
22	47 22	Tip Channel 22 Ring Channel 22	Violet/Orange Orange/Violet
23	48 23	Tip Channel 23 Ring Channel 23	Violet/Green Green/Violet
24	49 24	Tip Channel 24 Ring Channel 24	Violet/Brown Brown/Violet
25	50 25	Not used/Spare at this time	Violet/Slate Slate/Violet

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CHAPTER 4

Configuration

In this Chapter

- Setting up a CLI Connection
- System Information
- Basic System Setup
- Quick Configuration Reload
- Setup of DS0 Management Channel

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Setting up a CLI Connection

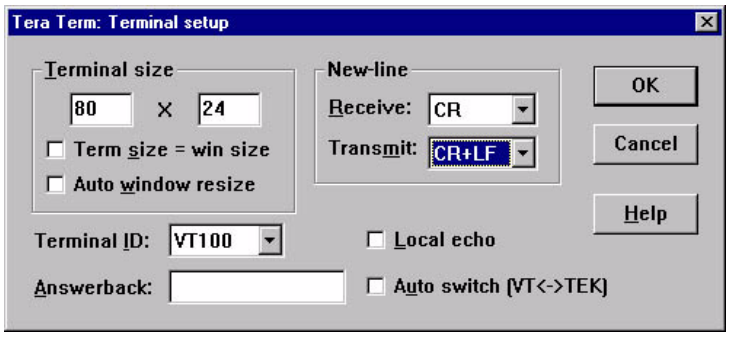
NOTE: The Default IP address of the Axxius 800 Controller (DS1 or DS3) is 10.0.0.10.

To connect to the CLI, set up the connection:

- If connecting via the ethernet 10Base-T connection, use a Telnet TCP/IP program to access the CLI. This requires an IP address of the Controller. The Controllers are shipped with the IP address set to 10.0.0.10, if this address has been changed and is not known, use HyperTerm to access the Controller and use the CLI command **show ip**. If an IP address needs to be set use the CLI command **set ethernet ip address {ip-addr}**.
- If connecting via RS-232 (HyperTerm), the port settings should be set to:
  Bits per second: **9600**
  Data bits: **8**
  Parity: **None**
  Stop bits: **1**
  Flow control: **None**
- Set your Terminal Emulation to: VT100

NOTE: Note: When using Tera Term TCP/IP, CLI commands will not be recognized until the following setup is completed.

- In Tera Term go to **Setup/Terminal**.
- Set the **New-line/Transmit** value "CR+LF".



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System Information

Once a management session has bee initiated (Telnet or Hyperterm) the system information will be displayed similar to the following:

```
Carrier Access  - Axxius Product Line
02:03:08 01/01/2002
  Login: helen
Status Equipment:

          CardType    Status        SW Vers     CLEI
SLOT P1   +24 V       Healthy                   SIPUMR0DAA
SLOT P2   Card not installed

SLOT A1   T1x4        Active         1.0.1      SIIX4W0DAA
SLOT A2   Card not installed

SLOT B1   Card not installed
SLOT B2   Card not installed

SLOT 1    TSRx4       Present         1.00       NOT AVAIL
SLOT 2    T1x4        Present         1.73      SIIXFWBDAA
SLOT 3    V35x2       Present         2.01      SIC3HK0CAA
SLOT 4    V35x2       Present         2.01      SIC3HK0CAA
SLOT 5    T1x4        Not Present
SLOT 6    T1x4        Not Present
SLOT 7    T1x4        Not Present
SLOT 8    FXSPSMx1    Present         0.01

Alarms:
     Time       Date     Severity Description
  00:00:14 01/01/2002 Major    1:1-TSR Ethernet Link Down
     Total=1

Status Sessions:
  Session     User           Login Port
* TELNET2     helen          10.0.0.0
* indicates current session
Show Autoexit:
Autoexit is off.
```


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Basic System Setup

Initial Setup

Use the following commands for your initial setup, for further information see the specific command listed in Chapter 5, CLI Commands.

Command	Description
`set date dd/mm/yyyy`	Set the system date, using the format *day/month/year*. See the *set date* command for details.
`set time {hh:mm:ss}`	Set the system time. See the *set time* command for details.
`set id {"id-name"}`	Set the systemID name. Remember to enclose this name in quotes. See the *set id* command for details.
`set clock {nonrevertive|revertive|switch}`	Set the signal clock switching. See the *set clock* command for details.
`set {clock1|clock2} {source}`	Set the primary and secondary clock source. See the *set clock (1 and 2)* command for details.
`set ethernet ip address {ip-addr} [mask]`	Set the Ethernet IP address and optionally the subnet mask, for the Axxius 800. See the *set ethernet ip address* command for details.
`set ip gateway {ip-addr}`	Set the IP gateway for the Axxius 800. See the *set ip gateway* command for details.
`clear log`	Initialize the event log. See the *clear key* command for details.
`status equipment [slot]`	See the status of the equipment. See the *status equipment* command for details.

NOTE: Removing an active Controller is not recommended, use the *switch controller* command to change the Active Controller to Standby and then remove the Controller card.

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Set Up Security

Use the following commands to set up the security on the Axxius 800.

Command	Description
`set user {"user-name"} level {1-3}`	Specify the user name and the security level. See *set user* command for details.
`set user {"user-name"} password`	Set a password for the user. See *set user* command for details.

Set Up IP Addresses for Telnet CLI

Use the following commands to setup Telnet addresses for Command Line Interface (CLI).

Command	Description
`set ethernet ip address {ip-addr} {mask}`	Set the Ethernet IP address, in the conventional IP address format. See the *set ethernet ip address* command for more details.
`set ip gateway {ip-addr}`	Set the IP gateway, in the conventional IP address format. See the *set ip gateway* command for more details.

Upgrade the Axxius 800 Software

Use the following commands to determine the Controller software level, then upgrade the software to the latest version.

Command	Description
`status equipment`	Determine the software level. See the *status equipment* command for more information.
`load tftp {ip-addr} {"file-name"} (or load xmodem)`	Load the new software to the Axxius 800. See the *load tftp* and *load xmodem* command for more information.

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Set Up a DS0/Channel

Use the following commands to set up a DS0.

Command	Description
`set {ds0-addr} type {data|voice}`	Set the channel type. See *set (ds0)* command for details.
`set {ds0-addr} signal {ls|gs|emw|emdw|emi|emicpd}`	Set the signaling option for the channel. See *set (ds0)* command for details.

Set Up a DS1/T1

Use the following commands to set up a DS1/T1. See the *set (ds1)* command for more details.

Command	Description
`set {ds1-addr} up`	Activate the port.
`set {ds1-addr} fdl {none|t1403}`	Set the Facilities Data Link (FDL) capabilities.
`set {ds1-addr} framing {d4| esf}`	Set the framing option for the DS1.
`set {ds1-addr} id {"id-name"}`	Set the circuit identification name for the DS1.
`set {ds1-addr} lbo {1-8}`	Set the line buildout value for the DS1.
`set {ds1-addr} linecode {ami|b8zs}`	Set the linecode for the DS1.
`set {ds1-addr} loopdetect {on|off}`	Set the detection/reaction to CSU loopcodes.
`set {ds1-addr} threshold {day|min15} {bes|css|dm|es |lcv|les|pcv|sefs|ses|uas)`	Set default thresholds for the DS1.

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Set Up a DS3

Use the following commands to set up a DS3. See the *set (ds3)* command for more details.

Command	Description
`set {ds3-addr} up`	Activate the port.
`set {ds3-addr} id {"id-name"}`	Set the DS3 ID.
`set {ds3-addr} clock {loop|normal}`	Set the transmit clock source.
`set {ds3-addr} berthreshold {value}`	Set the Bit Error Rate protection switchover threshold.
`set {ds3-addr} dejitter {off|on}`	Set the De-jitter buffer on or off.
`set {ds3-addr} equipment id {"string"}`	Set the DS3 equipment PMDL ID string.
`set {ds3-addr} facility id {"string"}`	Set the DS3 facility PMDL ID string.
`set {ds3-addr} frame {"string"}`	Set the DS3 frame PMDL ID string.
`set {ds3-addr} framing {cbit|m23}`	Set the framing option for the DS3.
`set {ds3-addr} location id {"string"}`	Set the DS3 location PMDL ID string.
`set {ds3-addr} portnum {"string"}`	Set the DS3 port number PMDL string.
`set {ds3-addr} gennum {"string"}`	Set the DS3 generation number PMDL string.
`set {ds3-addr} loopdetect {off|on}`	Set the detection/reaction to CSU loopcodes.

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Command	Description
`set {ds3-addr} protect {off|on}`	Set port protection on the DS3.
`set {ds3-addr} reversion {off|on}`	Set protection reversion on the DS3.
`set {ds1-addr} threshold {day|min15} {ccv|ces|cses|lcv |les|pcv|pes|pses|sefs|uas)`	Set default thresholds for a DS3.
`set {ds3-addr} unit {"string"}`	Set the DS3 unit code PMDL string.

Establish a Static Channel Connection

Use the following commands to establish a static channel connection.

Command	Description
`set {ds0-addr} type {voice|data}`	Set the channel type for the channel you want to map. See *set (ds0)* command for details.
`set {ds0-addr} signal {emdw| emi|emicpd|emw|gs|ls}`	Set the signaling option for the channel you want to map. See *set (ds0)* command for details.
`connect {slot:port} {slot:port}`	Connect the channels. See the *show connect* command for details.

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Setup of ADPCM

Command	Description
`Connect T1 cable to port 1 of the ADPCM service card`	
`set {adpcm_card-addr} {none|map1|map2|map3}`	Enable compressing by selecting Map type. Note: **none** disables compression.
`show (adpcm_card-addr}`	Displays the status of the card, and the mapping.
`connect 2:1:1-12 2:4:1-12`	Set ADPCM cross-connects. The example connects all 24 channels of the ADPCM to the 12 channels of the T1 (now compressed) on port 4. This example is with **map2**
`show connect {2:1)`	Displays the connections made above.

Set Up a V.35 Port

Use the following commands to set up a V.35 port.

Command	Description
`set {v35-addr} cts {cd|high|low|rts}`	Set the Clear to Send operation mode. See *set (v35)* command for details.
`set {v35-addr} data {invert|normal}`	Set the data mode. See *set (v35)* command for details.
`set {v35-addr} clock {source|external}`	Set the clock mode. See *set (v35)* command for details.
`set {v35-addr} speed {56K|64K}`	Set the speed. See *set (v35)* command for details.
`set {v35-addr} txclkinv {invert|normal}`	Set the transmit clock inversion mode. See *set (v35)* command for details.
`set {v35-addr} rxclkinv {invert|normal}`	Set the receive clock inversion mode. See *set (v35)* command for details.

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Set Up a Single Channel POTS card

Use the following commands to set up a POTS card.

Command	Description
`set {fxsPS-addr|fxsPSM-addr} {ls|lsrb}`	Set the signaling option for the port. See the *set (fxsPS or fxsPSM)* command for details.
`set {fxsPS-addr|fxsPSM-addr} rxgain {n}`	Set the receive gain/loss in dB. See the *set (fxsPS or fxsPSM)* command for details.
`set {fxsPS-addr|fxsPSM-addr} txgain {n}`	Set the transmit gain/loss in dB. See the *set (fxsPS or fxsPSM)* command for details.

Change the IP Address of the DS0 Management Channel

Use the following commands to change the IP over DS0 Management Channel for the Axxius 800.

Command	Description
`set ipds0 down`	Set the DS0 management channel down
`set ipds0 ip address {ip-addr}`	Set the DS0 management channel IP address.
`set ipds0 up`	Set the DS0 management channel up.

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Quick Configuration Reload

The **`print config`** command can be used as a quick way to reload a configuration into an Axxius unit, in the event that the configuration has been lost due to software reload problems or operator error.

The download of the file generated by the **`print config`** command can be done by direct connect to the RS-232 port or via Telnet, **BUT** the upload from the PC back to the Axxius can only be done via direct RS-232 connection. The reason for this is that there will not be an IP address in the Axxius because it is at the factory default at this time.

The procedure described below is based on using Hyperterm.

Download Config File:

1. Connect to the unit using Hyperterm via the RS-232 port.
2. Type **`print config`** (do not hit **[ENTER]**).
3. Select **Transfer/Capture Text...** from the menu bar.

4. Name the file so that is can be accessed when needed.

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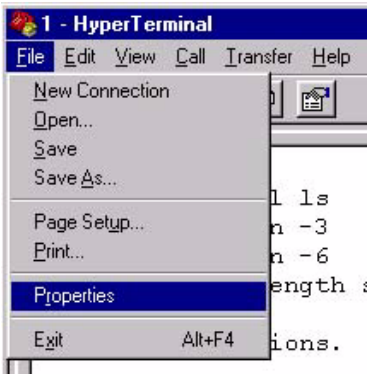
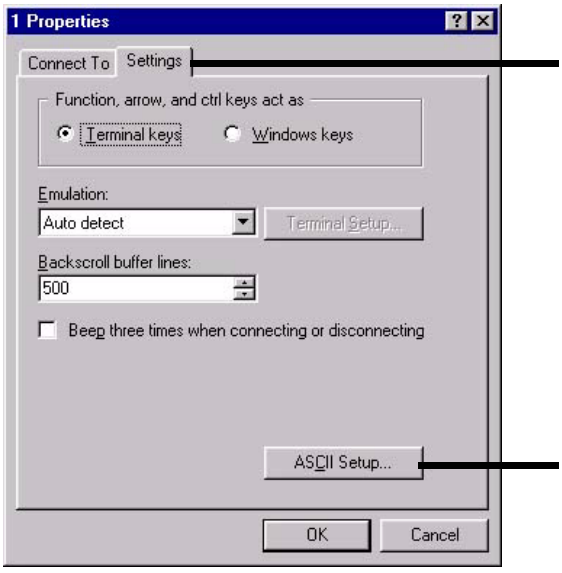
5. Select the **[START]** button, the window will close and the operator will be returned to the Axxius command line.
6. Press **[ENTER]** to download. Axxius will generate an executable file of all configurable commands and save it to the file location defined above.
7. The download is complete when the text has finished scrolling on the screen and the Axxius ID prompt displays again.

Load Config File Back to Unit:

1. Select **File/Properties** from the menu bar.



2. Select the **Settings** tab.



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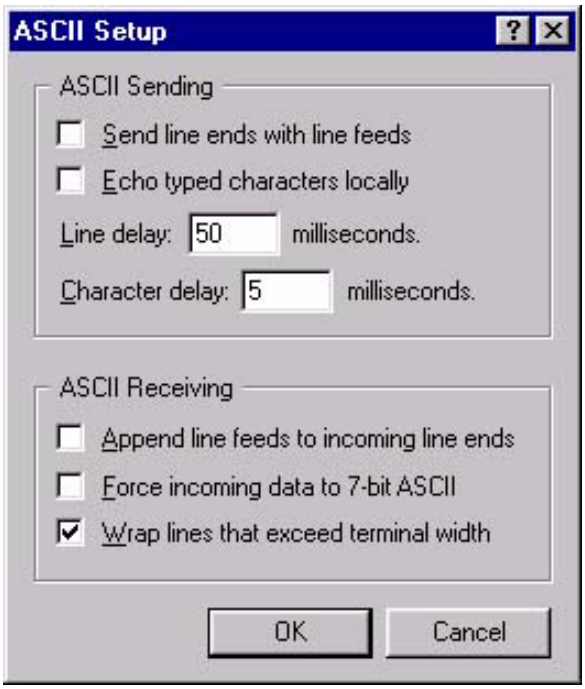
3. Select the **ASCII Setup** button.
4. Set the **Line delay** to 50 milliseconds and the **Character delay** to 5 milliseconds.



5. Select the **[OK]** button back to the Main HyperTerminal screen.
6. Select **Transfer/Send Text File...** from the menu bar.

Hyperterm will now send the configuration to the Axxius exactly as it was saved in the Download Config File process.

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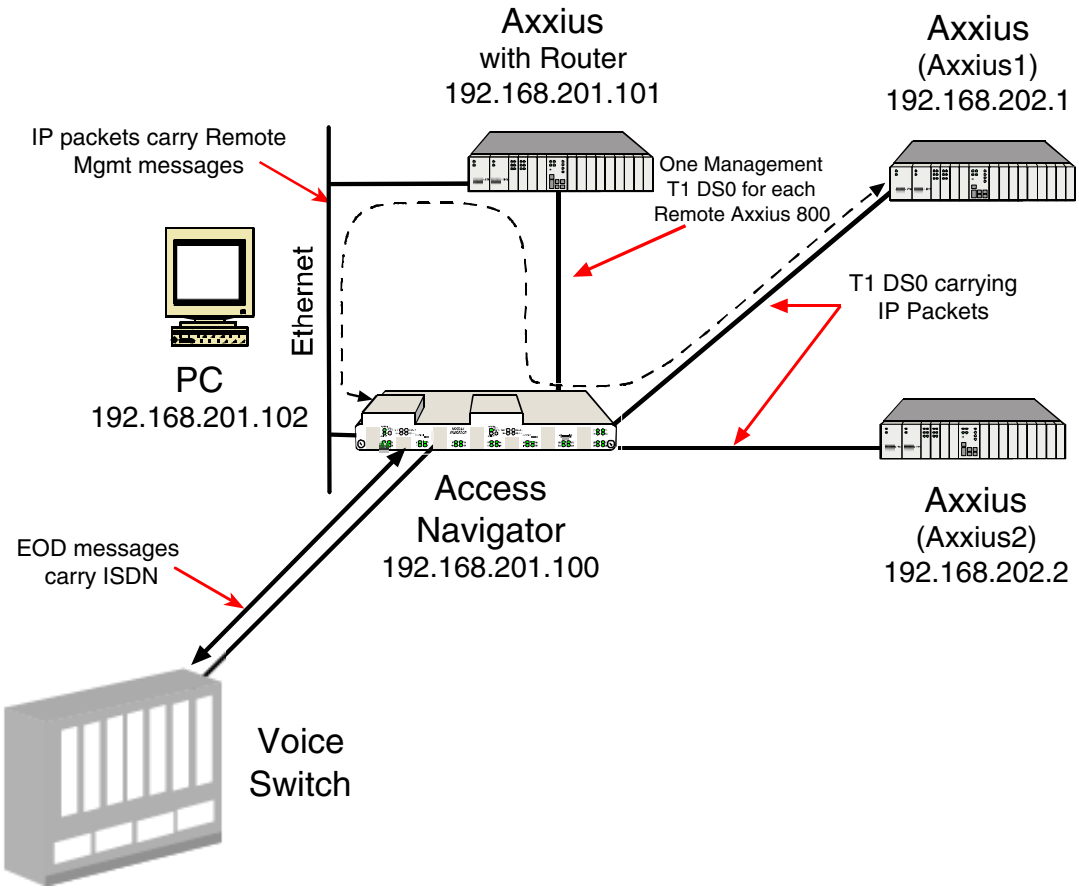
Setup of DS0 Management Channel

The DS0 Management Channel provides an alternative to the FDL link for management information where FDL is unavailable. The Access Navigator and the remote Axxius 800 will use IP packets to communicate management and control information over the DS0 Management channel. A DS0 Channel will be used in the remote Axxius 800 to send and receive the management IP packets.

The Navigator sends and receives the IP packets over its Ethernet connection while the remote Axxius sends and receives the IP packets over a DS0 channel. A channelized router takes the IP messages from the Ethernet to send them over DS0 channels (WAN) and vice versa. The DS0s coming out of the router are on a single T1. It connects to the Navigator, where the DS0s are cross-connected to the remote Axxius.

The following procedure will walk you through the basic setup of a DS0 Management Channel.



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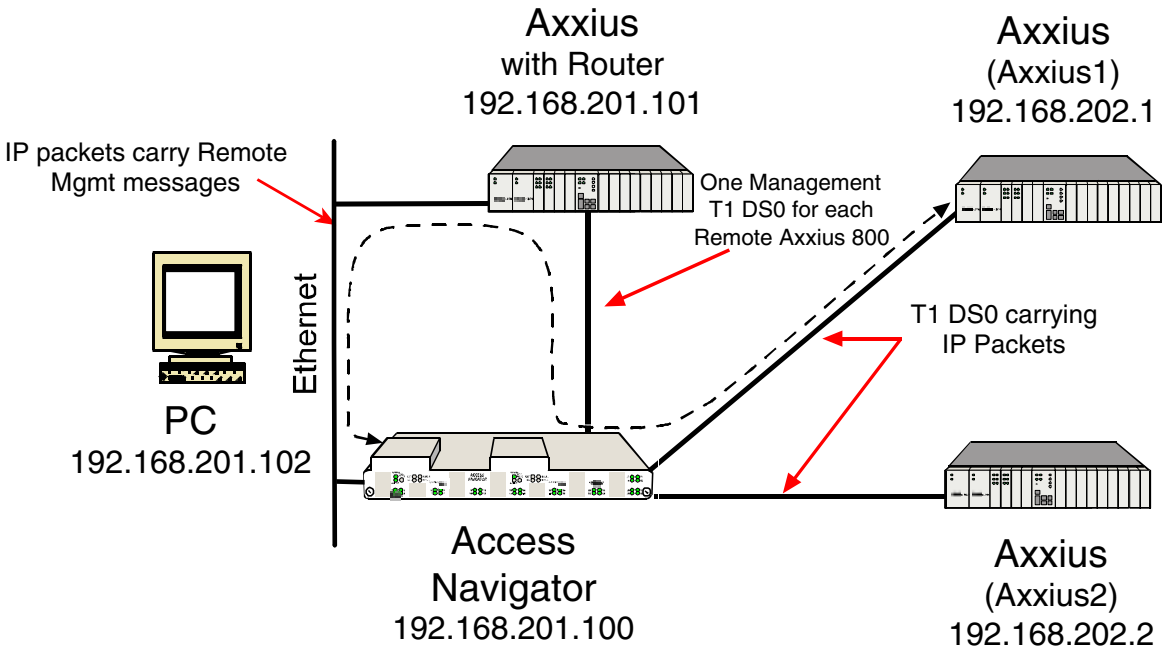
Equipment Required

- Access Navigator (version 1.7)
- (1) Collocated Router
  This example uses a Axxius 800 (version 1.0) with a Axxius TSR card (version 1.0)
- Remote Axxius
  (1-24) Axxius 800 (version 1.0)
- PC
- Cables
  Ethernet
  T1



Basic Setup

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The following is the Address and DS1 assignments used in this example. This will configure 1 Access Navigator, one TSR and 24 remote Axxius units.

	LAN addr	WAN addr	Navigator DS1	Navigator mgmt DS0 to Router Axxius	Axxius DS0 to Navigator
Navigator	192.168.201.100	-	-	-	-
Router	192.168.201.101	-	32	-	-
PC	192.168.201.102	-	-	-	-
Axxius1	-	192.168.202.1	1	32:1	a:1:1
Axxius2	-	192.168.202.2	2	32:2	a:1:2
Axxius3	-	192.168.202.3	3	32:3	a:1:3
Axxius4	-	192.168.202.4	4	32:4	a:1:4
Axxius5	-	192.168.202.5	5	32:5	a:1:5
Axxius6	-	192.168.202.6	6	32:6	a:1:6
Axxius7	-	192.168.202.7	7	32:7	a:1:7
Axxius8	-	192.168.202.8	8	32:8	a:1:8
Axxius9	-	192.168.202.9	9	32:9	a:1:9
Axxius10	-	192.168.202.10	10	32:10	a:1:10
Axxius11	-	192.168.202.11	11	32:11	a:1:11
Axxius12	-	192.168.202.12	12	32:12	a:1:12
Axxius13	-	192.168.202.13	13	32:13	a:1:13
Axxius14	-	192.168.202.14	14	32:14	a:1:14
Axxius15	-	192.168.202.15	15	32:15	a:1:15
Axxius16	-	192.168.202.16	16	32:16	a:1:16
Axxius17	-	192.168.202.17	17	32:17	a:1:17
Axxius18	-	192.168.202.18	18	32:18	a:1:18
Axxius19	-	192.168.202.19	19	32:19	a:1:19
Axxius20	-	192.168.202.20	20	32:20	a:1:20
Axxius21	-	192.168.202.21	21	32:21	a:1:21
Axxius22	-	192.168.202.22	22	32:22	a:1:22
Axxius23	-	192.168.202.23	23	32:23	a:1:23
Axxius24	-	192.168.202.24	24	32:24	a:1:24

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Set IP Configuration of PC

1. Set IP Address to 192.168.201.102
2. Set Gateway to 192.168.201.101 (Router LAN Address)

Configuring the Axxius Router

NOTE: The Remote Axxius WAN address MUST have a different subnet than the Axxius Controller Ethernet address.

WAN Connections

The following WAN connections are made from a default condition with one (1) TSR card installed set with factory defaults.

NOTE: An Axxius TSR is capable of managing 24 virtual WAN connections through one of the ports of the Controller card. If support of more than 24 Axxius units is required a Quad T1 and TSR card(s) can be added; this however, can only be done on the collocated TSR, not on a remote Axxius.

1. From the CLI execute the following command to connect one DS0 to each one of the 24 WANs.

Command	Description
`set local off`	Sets the Axxius to be configured through CLI
`set a:1 down`	Sets port 1 of the Controller as Out-of-Service
`disconnect a`	Disconnects all connections to slot a (controller)
`set a:1:1-24 type data`	Sets all DS0s on the DS1-1 to data signaling type
`connect a:1:1 1:1:1`	Connects first DS0 of port 1 of the Controller to port 1, WAN 1 of the Router in slot 1.
`connect a:1:2 1:1:2`	Connects second DS0 of port 1 of the Controller to port 1, WAN 2 of the Router in slot 1.
`connect a:1:3 1:1:3`	Up to 24 WAN connections (a:1:24 1:1:24)

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Add and Enable all Remote Axxius Needed

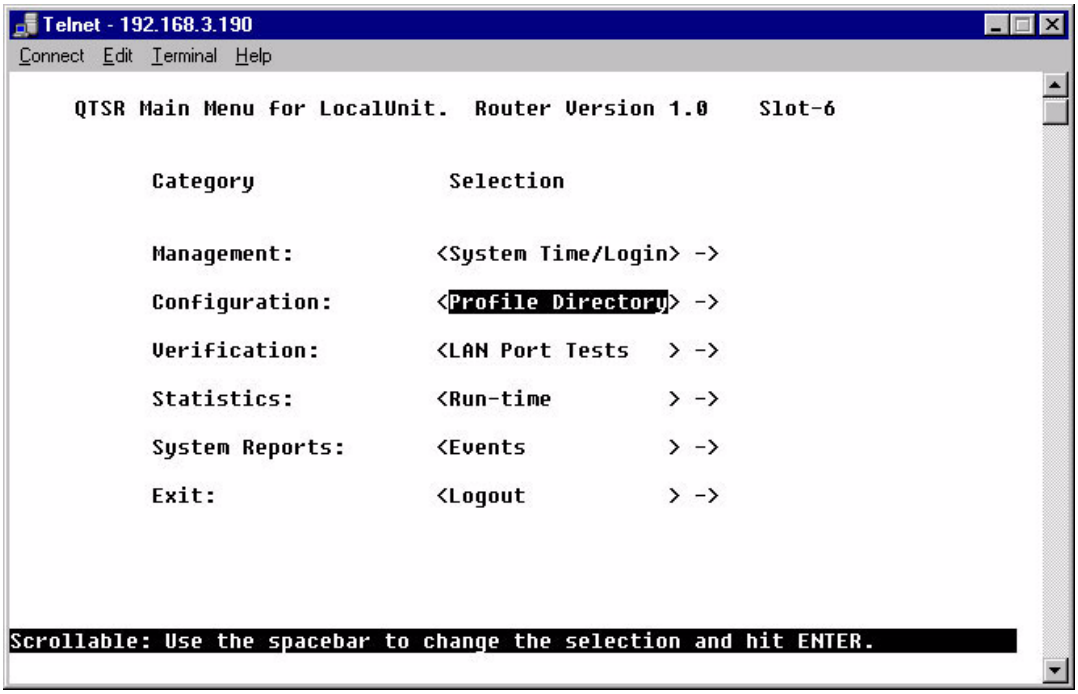
Telnet into the TSR card

1. From the CLI execute a Telnet command to the TSR card.
   Telnet {slot}

Example: `telnet 1`

The example will Telnet into the router located in slot 1.

2. Enter password (default is "admin") and select **[ENTER]**.
3. Select Terminal Emulation (scroll with **[TAB]**) and select **[ENTER]**.



Once you are in the router, the **[TAB]** key will move you through the menus and the **[SPACEBAR]** will scroll you through selections in **< >**.

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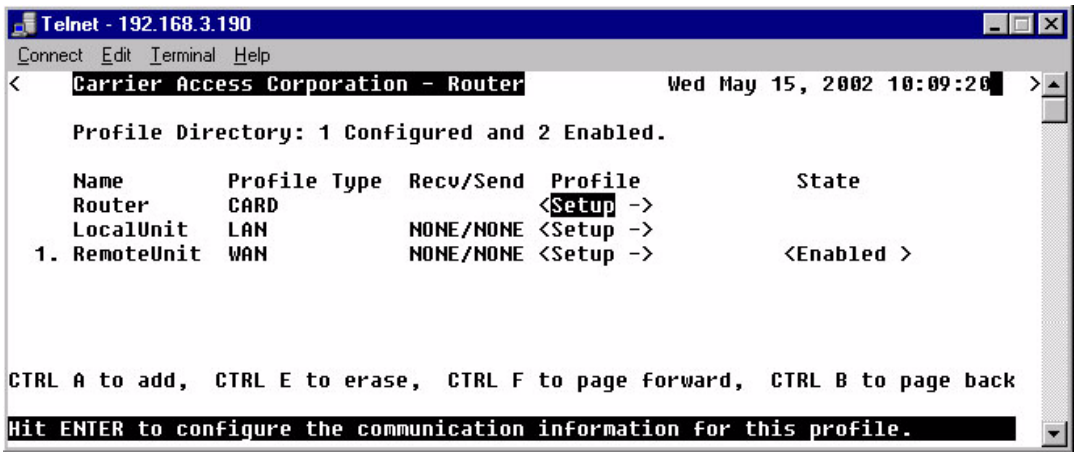
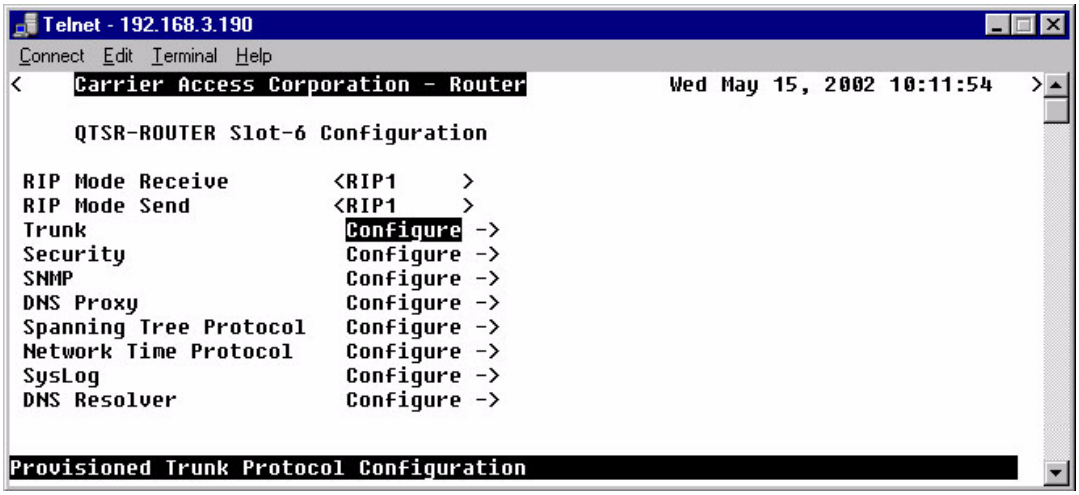
Configure Trunk Connections

1. Select **Configuration < Profile Directory > ->** from the Router Main Menu and select **[ENTER]**.
2. Select **Router CARD <Setup - >** from the Profile window and select **[ENTER]**.


Telnet - 192.168.3.190
Connect Edit Terminal Help
Carrier Access Corporation - Router
Wed May 15, 2002 10:09:20
Profile Directory: 1 Configured and 2 Enabled.
Name Profile Type Recv/Send Profile State
Router CARD <Setup ->
LocalUnit LAN NONE/NONE <Setup ->
1. RemoteUnit WAN NONE/NONE <Setup -> <Enabled >
CTRL A to add, CTRL E to erase, CTRL F to page forward, CTRL B to page back
Hit ENTER to configure the communication information for this profile.

3. Select **Trunk <Configure - >** and select **[ENTER]**.



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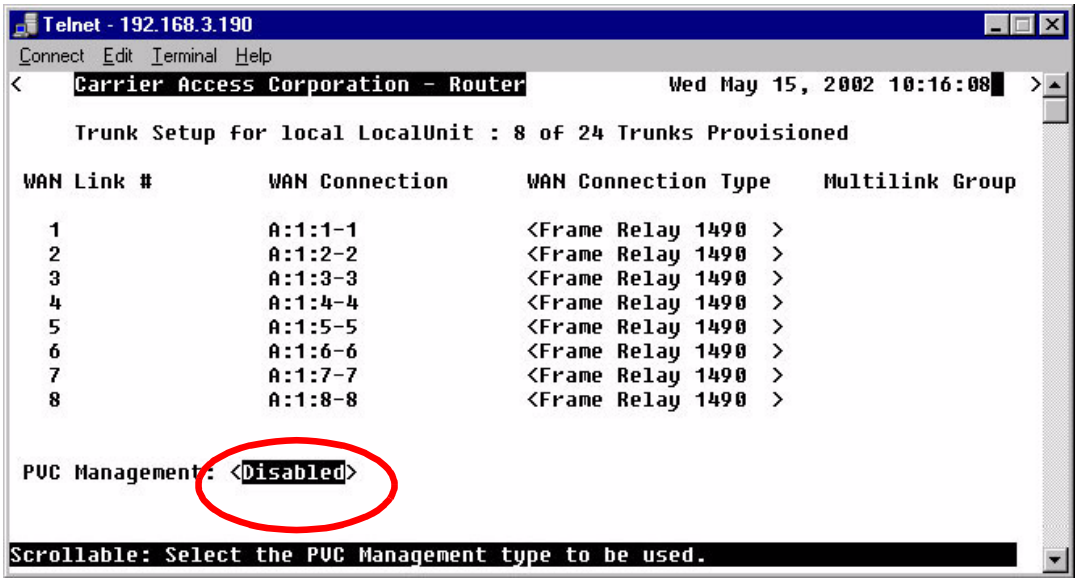
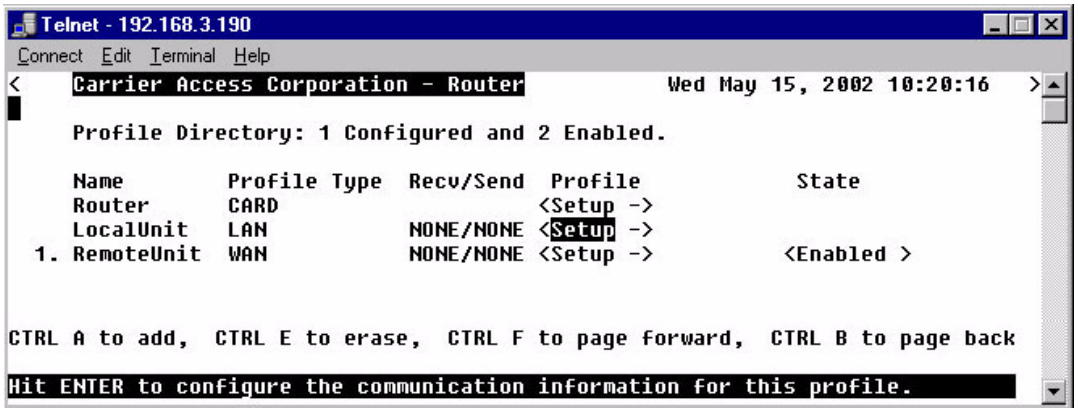
4. For all WAN port numbers already assigned a DS0 for management select **< Frame-Relay 1490 >** as the WAN connections type.



5. Select the **PVC Management** as **< Disabled >**.
6. Select the **[ESC]** key to Exit and **<Yes>** to save changes. This will return to the **Trunk Configure** window. For these configuration changes to take effect, you must Reinitialize the Router.

Configure the Local Axxius Profile

1. Select **Configuration < Profile Directory > ->** from the Router Main Menu and select **[ENTER]**.
2. Select **LocalUnit LAN <Setup - >** and select **[ENTER]**.



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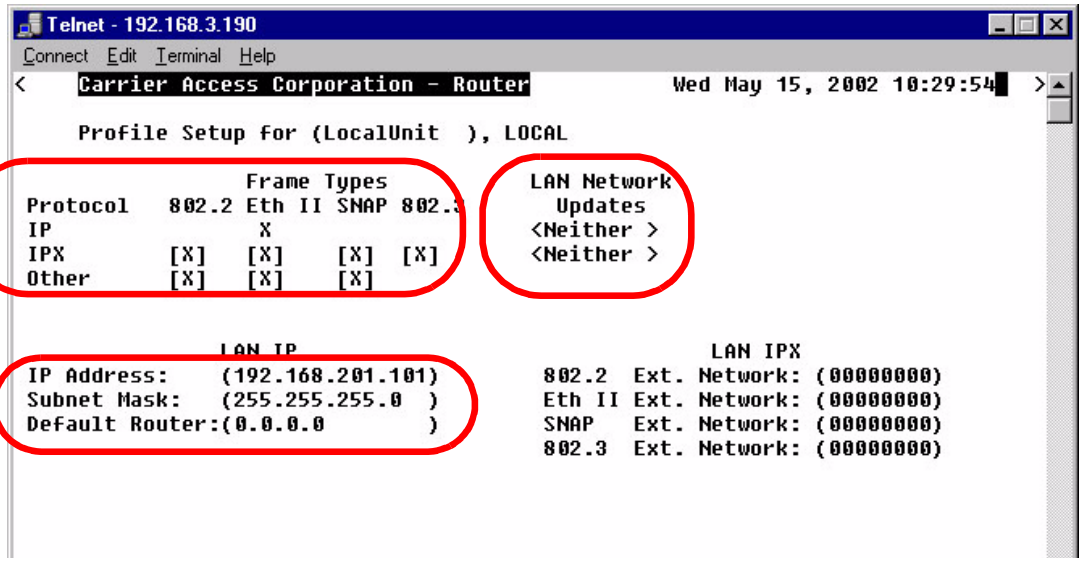
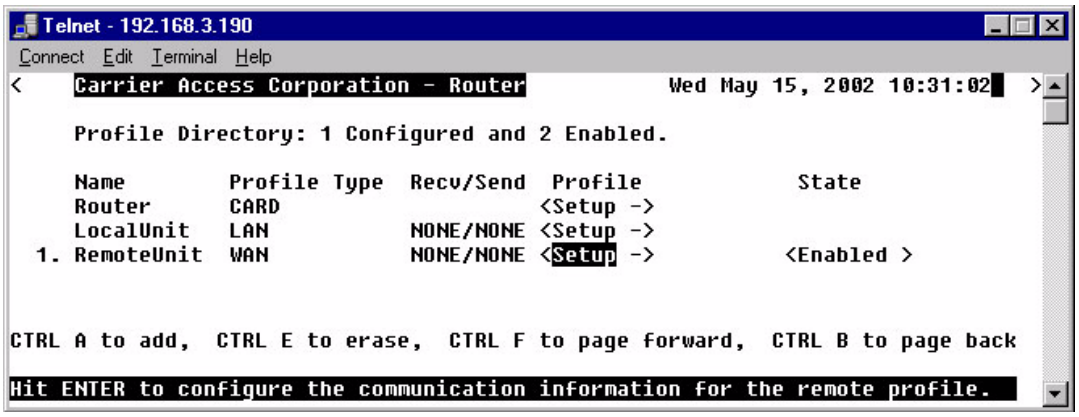
3. Set the following on this screen:
   Select the **IP Protocol Eth II** (X), all others should not be selected.
   Set the **LAN Networks Updates** for **IP** and **IPX** to **< Neither >**.
   Set the **LAN IP Address** to **192.168.201.101** (Router IP Address) along with the **Subnet Mask** of **255.255.255.0**.



4. Select **[ESC]** to exit menu and **<Yes>** to save changes.

Create a Remote Axxius Profile for all Remotes

1. Select **RemoteUnit WAN <Setup >** from the **Profile Directory** main window and select **[ENTER]**.


Telnet - 192.168.3.190
Connect Edit Terminal Help
Carrier Access Corporation - Router
Wed May 15, 2002 10:31:02
Profile Directory: 1 Configured and 2 Enabled.
Name Profile Type Recv/Send Profile State
Router CARD <Setup ->
LocalUnit LAN NONE/NONE <Setup ->
1. RemoteUnit WAN NONE/NONE <Setup -> <Enabled >
CTRL A to add, CTRL E to erase, CTRL F to page forward, CTRL B to page back
Hit ENTER to configure the communication information for the remote profile.

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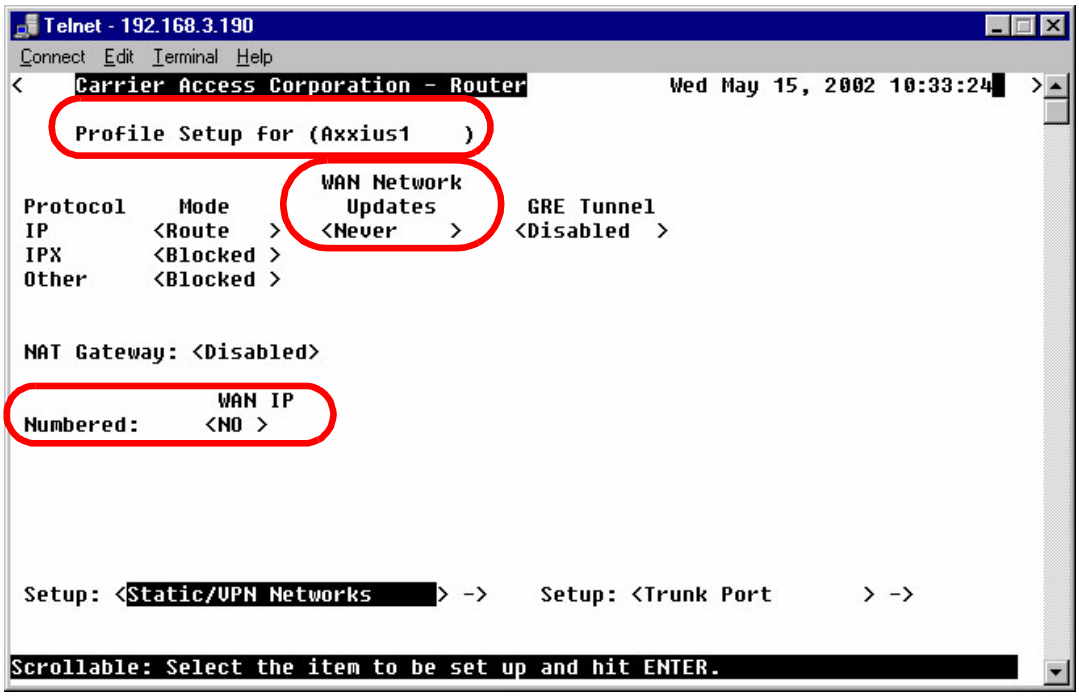
2. Set the following on this screen:
   Rename **RemoteUnit** (default name) to **Axxius1**.
   Set **WAN Networks Updates** for **IP** to **<Never>**.
   Set **WAN IP: Numbered** to **<No>**.



3. **[TAB]** to **Setup: <Static/VPN Networks >** (scroll to this selection if it is not displayed).
   Note: if the IP Protocol is set to <Bridge > this option will not be available.
4. Set **Setup Static:** to **<IP Networks>** (scroll to this selection if it is not displayed)
5. Select **[CTRL A]** to add a Static IP Address.

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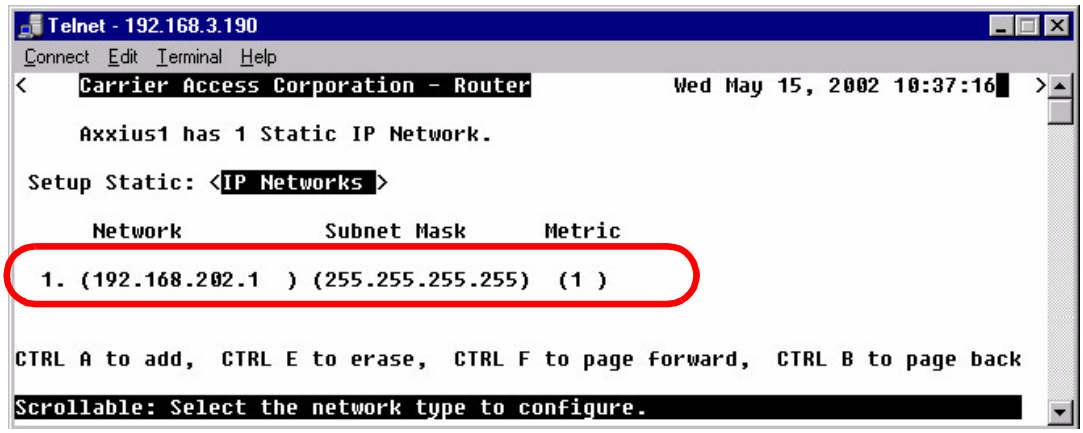
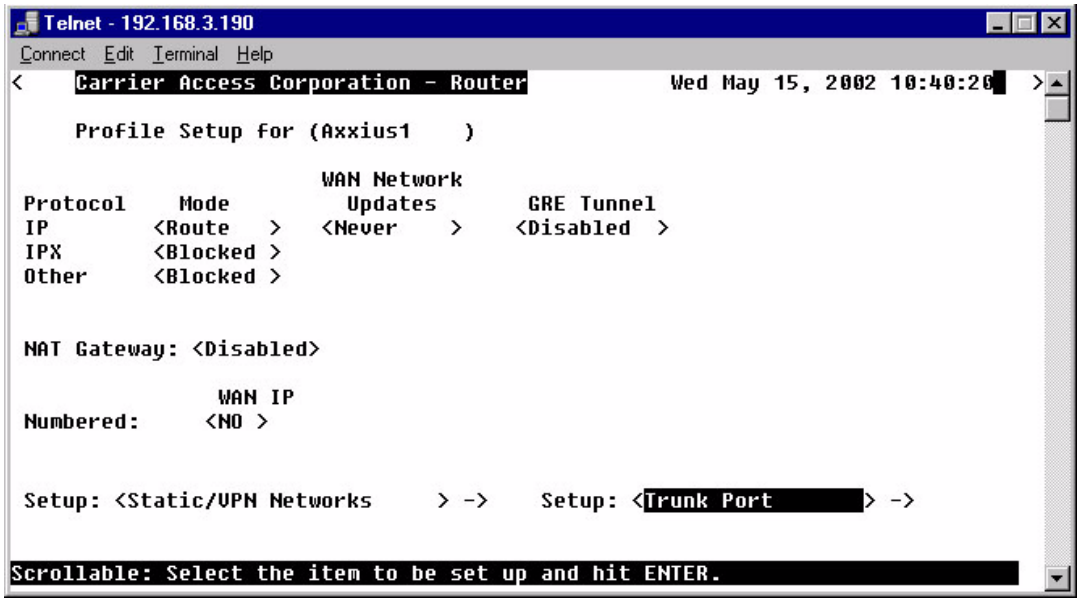
6. Set **Device Name** to **Axxius1**
   Set the **IP Address** to **192.168.202.1** (Axxius1 WAN address)
   Set the **Subnet Mask** to **255.255.255.255**
   Set the **Metric** to **1**


Telnet - 192.168.3.190
Connect Edit Terminal Help
Carrier Access Corporation - Router
Wed May 15, 2002 10:37:16
Axxius1 has 1 Static IP Network.
Setup Static: <IP Networks >
Network
Subnet Mask
Metric
1. (192.168.202.1) (255.255.255.255) (1)
CTRL A to add, CTRL E to erase, CTRL F to page forward, CTRL B to page back
Scrollable: Select the network type to configure.

7. Select **[ESC]** to exit and **<Yes>** to save changes.
8. Select **Setup: <Trunk Port >** and select **[ENTER]**.



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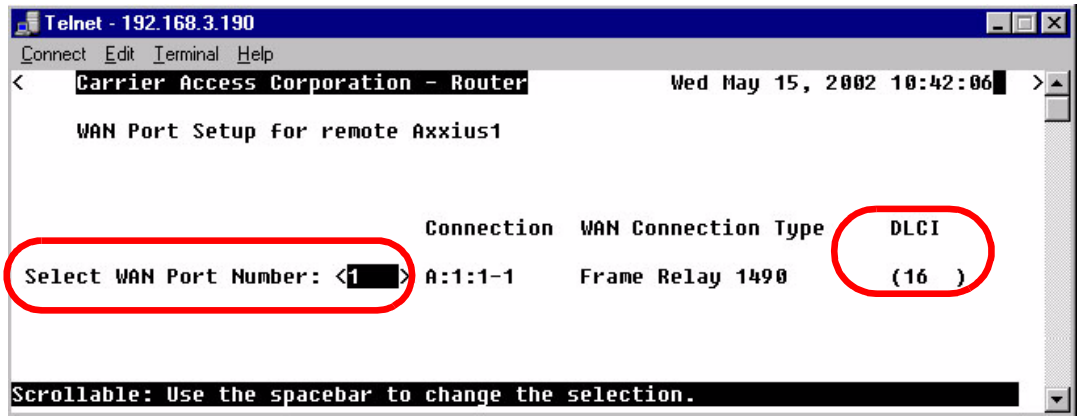
9. Select the following on this screen:
   At the **Select WAN Port Number: <None>**, scroll from **None** to **1** (which is the remote Axxius1).
   Set **DLCI** to **16**.



10. Select **[ESC]** to exit the **Trunk Port** configuration window.
11. Select **[ESC]** to exit and **<Yes>** to save changes.

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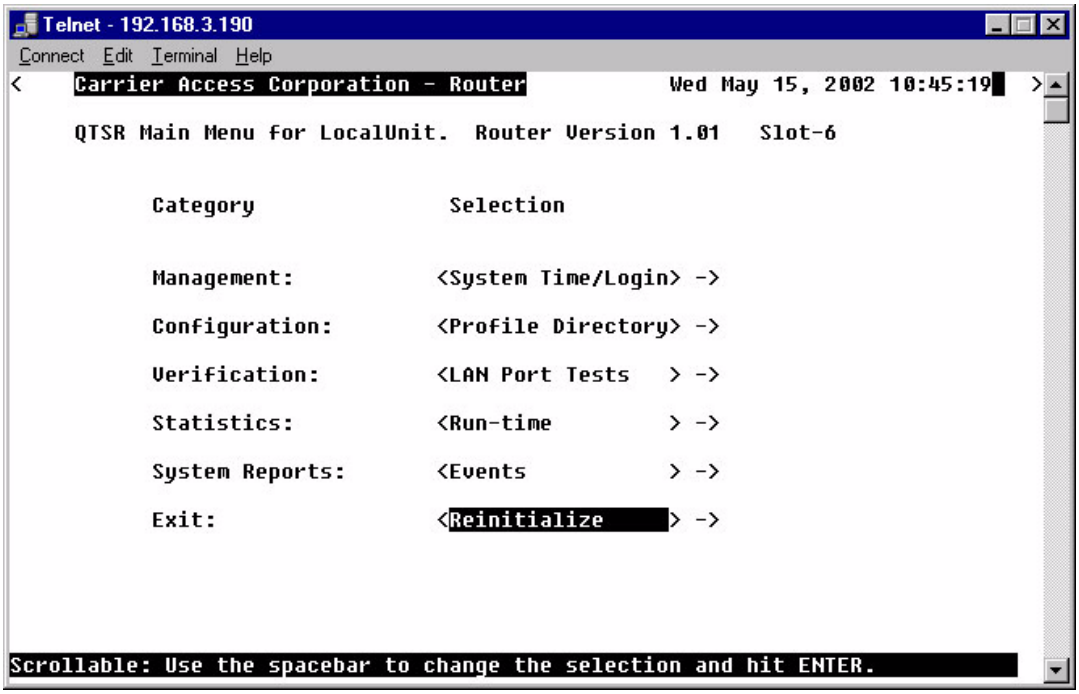
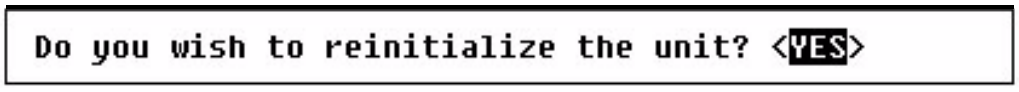
Reinitialize the Router

1. Select **Exit <Reinitialize >** from the **Router** main window and select **[ENTER]**.



2. Select **<YES>** and select **[ENTER]** to Reinitialize the TSR Card. This will save all the changes recently made to the Router.



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Configuration of Remote Axxius

Note: The Ethernet cannot be connected to the Remote Axxius during the setup of the DS0.

Use the following commands to setup the IP over DS0 Management Channel for each Remote Axxius 800. connect to the Axxius1, use the following CLI commands to setup the DS0 Management Channel.

Note: the following commands are assuming that the Remote Units are set to factory defaults.

Command	Description
`set local off`	Sets the Axxius to be configured through CLI
`set a:1 down`	Sets the port 1 of the Controller as Out-of-Service
`disconnect a`	Disconnects all connections to slot a (controller), assuming there are not any established cross-connects that need to remain.
`set a:1:1-24 type data`	Sets all DS0s on port 1 of the Controller to data signaling type
`set ipds0 assign a:1:24`	Assigns the DS0 as the IP management channel
`set ipds0 ip address 192.168.202.1 255.255.255.0`	Set the DS0 management channel IP address (the Axxius1 WAN address is inserted here)
`set ipds0 up`	Set the DS0 management channel up
`set snmp nms1 xxx.xxx.xxx.xxx`	Sends alarms to server. Sends alarms to server. xxx.xxx.xxx.xxx is the IP Address of the server.
`show connect a:1`	Displays connections to port 1 of the Controller
`show ipds0`	Will display the configurations of the DS0 management channel
`status ipds0`	Will display the operational status (up/down) of the DS0 management channel to the Navigator

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Configuration of Access Navigator

Note: The Ethernet cannot be connected to the Remote Axxius during the setup of the DS0.

The following setup, creates a path from the Axxius Router to the remote Axxius.

Note: the following commands are assuming that the Access Navigator is set to factory defaults.

Command	Description
`set ds1 1-32 down`	Sets 1-32 Out-of-Service
`set ethernet ip address 192.168.201.100 255.255.255.0`	Sets the Ethernet IP address of the Navigator and it's subnet mask
`set ip gateway 192.168.201.101`	Sets the gateway (router address)
`set ds1 32 type groom`	Sets DS1 32 to groom
`set ds0 32:1-24 type data`	Sets DS0 32 1-24 to data signaling type
`set ds1 1 remote device mgmt caip 192.168.202.1`	Sets DS1 1 as the Management Channel with the Router (address listed)
`set ds0 1:24 type data`	Sets DS0 1-24 to data signaling type
`connect 1:24 32:1`	Connects DS1 1:DS0 24 to DS1 32, DS0 1
`set ds1 32 up`	Sets DS1 32 In Service
`set ds1 1 up`	Sets DS1 1 In Service
`set snmp nms1 xxx.xxx.xxx.xxx`	Sends alarms to server. xxx.xxx.xxx.xxx is the IP Address of the server.
`show ds1 1`	Displays DS1 1 information
`show ip`	Displays IP Address information
`show connect 1`	Displays connections on DS1 1
`status remote 1`	Displays the status of the Management Channel

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Testing the DS0 Management Channel

After the DS0 management channels has been setup with one Remote Axxius, test the management channel.

1. PING 192.168.202.1 (Axxius1) from the Axxius Router.
2. PING 192.168.202.1 (Axxius1) from the Navigator.
3. PING 192.168.202.1 from the PC.
4. Telnet 192.168.202.1 from the PC to the Remote Axxius.

Once the Management Channel is working properly, add additional Remote units. Test the DS0 Management Channel after each additional unit has been setup.

With the successful completion of the setup and test of the DS0 Management Channels, the Ethernet may be reattached to the network.

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CHAPTER 5

CLI Commands

In this Chapter

- Command Line Interface Help
- CLI Commands

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Command Line Interface Help

During a CLI session, help is available at any time.

? or help

Type a **?** (or "help" before a command) at any time for quick command information

```
> add ?

 add ......................  Create users or profiles
   {rtr_card-addr} ......  Create profile, object or service on a router
    {rtr_lan-addr} .......  Create object or service on the router LAN
    user .................  Create user with manager level access.
```

NOTE: The scrolling feature, will always scroll through the command/ options in alphabetical order.

[TAB] usage for word or command completion

Use [TAB] for command word completion:

> sh [TAB]

> show

Use [TAB] to view command levels:

> [TAB] will scroll through the base commands

> aco [TAB]

> add [TAB]

> alarms [TAB]

> clear [TAB]

> connect [TAB]

> delete ... etc.

Use [TAB] to view command options, add a space after the base command with the use of

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the [TAB] feature, scroll through all available options for this command:

> set [TAB] will scroll through the set commands, with each <TAB>

> set alarms [TAB]

> set autoexit [TAB]

> set clock1 ... etc.

If another space is placed after the command and [TAB] is pressed again, the next command level will display (if any):

> set snmp [TAB] will scroll through all the set SNMP options

> set snmp contact [TAB]

> set snmp getcom [TAB]

> set snmp location [TAB]

> set snmp name ... etc.

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CLI Commands

For maneuverability through these commands, all command names in blue or italics are hyperlinked.

aco (Alarm Cut Off)
add
alarms
clear
connect
delete
disconnect
exit
install
load
log
ping
print
rename (router)
reset
restore
rtrping
set
show
status
store
switch
telnet
trace route

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aco (Alarm Cut Off)

Use the **aco** command to activate the Alarm Cut Off, which opens the alarm relay contacts on the back of the unit.

Syntax: `aco`

Example: `aco`

ACO LED

Off	Normal mode. No alarms are being suppressed.
Yellow	Alarm cutoff active. One or more active alarms suppressed.

To turn off ACO, all alarms must be cleared, or the operator can reset the controller, which will set the ACO back to the default (off) state.

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add

Use the **add** command to create users, interfaces, services or profiles.
See the following sections for detailed information on the following **add** commands

add (ds1) ais

add (router) dhcp server option

add (router) dns proxy

add (router) remote

add (router) snmp community

add (router) snmp trap

add (router) static dns host

add (router) uploaduser

add (router-lan) filter

add (router-lan) secondary ip address

add (router-lan) static

add (router-wan) firewall

add (router-wan) gre network

add (router-wan) nat bypass

add (router-wan) static

add user

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add (ds1) ais

Use the **add (ds1) ais** command to add DS1s to a list for the AIS Forwarding feature. The DS1 enabled for AIS forwarding will be checked against the DS1s defined in the list.
Note: If no list is defined, AIS will go to all the DS1s cross-connected to that DS1.

Syntax: `add {ds1-addr} ais {all|{ds1-addr1}, [ds1-addr2], [ds1-addr3], [ds1-addr4]}`

Example: `add 1:1 ais 2:1, 3:1, 4:1, 5:1`

{ds1-addr}

Enter the DS1 that has AIS enabled.

The Controller DS1 addresses are different on the DS3 and DS1 Controller, however the DS1 address on the services cards does not change with Controller type (DS3 or DS1).

DS1 Address on a DS3 Controller in the form {slot:port:channel}		
	slot	A for the DS3 Controller card.
	port	Port number, list or all.
	ds1 channel	Channel number, list or all.
DS1 Address on a DS1 Controller or service cards (with DS1 or DS3 controller) in the form {slot:port}		
	slot	A for the DS1 Controller card, or 1-8 for service cards.
	port	Port number, list or all.

all

Creates a AIS DS1 list all DS1s in the system to be configured to trigger sending AIS.

{ds1-addr1}, [ds1-addr2], [ds1-addr3], [ds1-addr4]

Creates a AIS DS1 list of up to 4 DS1s to be configured to trigger sending AIS.

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add (router) dhcp server option

Use the **add (router) dhcp server option** command to add optional DHCP server attributes that will be advertised every time a DHCP client discovery is initiated. This provisioning takes effect immediately and can only be performed when the DHCP server is enabled.

Syntax: **`add {rtr_card-addr} dhcp server option {tag} {setting}`**

Example:
```
add 2 dhcp server option 19 false
add 2 dhcp server option 13 byte1 200
add 2 dhcp server option 160 byte2 3200
add 2 dhcp server option 170 byte4 0xFEDCBA98
add 2 dhcp server option 12 "www.carrieraccess.com"
add 2 dhcp server option 150 192.168.0.33
add 2 dhcp server option 150 192.168.0.33 10.40.1.1
20.0.0.1 100.150.3.97
```

{rtr_card-addr} - The slot number (1-8) that contains the Router (TSR) card.

{tag} - Range is 1-254. Options tags are unique, duplicate numbers will be rejected. To change an option with the same tag, the old option must be deleted and then the new option re-entered. 0 = off. Reserved numbers 6, 15, 44, 46, 47, 50, 51, 53, 54, 61.

{settings}

{true/false}	Boolean uses true or false
{byte1|byte2|byte4} {value}	byte1 = send **value** in 1 byte byte2 = send **value** in 2 bytes byte3 = send **value** in 4 bytes value = any numeric value.
{"string"}	Unidentified with a maximum of 50 characters, enclosed in quotes.
{ip-addr} [ip-addr] [ip-addr] [ip-addr]	IP address in the form xxx.xxx.xxx.xxx, where xxx is a number from 0 to 255.

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add (router) dns proxy

Use the **add (router) dns proxy** command to enable DNS proxy and add a remote DNS server address to the specified Router card.

Syntax: **`add {rtr_card-addr} dns proxy {"domain-name"} {ip-addr} {"profile-name"}`**

Example: **`add 2 dns proxy "Domain1" 192.168.100.245 "Texas"`**
Example will add a DNS proxy server "Domain1" with address 192.168.100.245 to the WAN named "Texas" on the TSR in slot 2.

{rtr_card-addr}

The slot number (1-8) that contains the Router card.

{"domain-name"}

The domain name for the external DNS server. Name must be enclosed in quotes, with a maximum length of 42 characters.

{ip-addr}

The IP address of the external DNS server, in the form of xxx.xxx.xxx.xxx, where xxx is between 0-255.

{"profile-name"}

The profile name for the Router interface that is used to reach this destination. Name must be enclosed in quotes, with a maximum length of 11 characters.

add (router) remote

Use the **add (router) remote** command to add a remote WAN profile to the WAN profile table on the specified Router card.

Syntax: **`add {rtr_card-addr} remote {"profile-name"}`**

Example: **`add 6 remote "Texas"`**
The example will add a remote WAN named "Texas" to the WAN profile table for the TSR in slot 6.

{rtr_card-addr}

The slot number (1-8) of the Axxius chassis that contains the Router card.

{"profile-name"}

The name of the remote WAN profile to add with a maximum length of 11 characters. This name must be enclosed in quotes.

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add (router) snmp community

Use the **add (router) snmp community** command to add a SNMP community to an interface on the specified Router card.

Syntax: **`add {rtr_card-addr} snmp community {read|write|both} {"community-name"} {ip-addr}`**

Example: **`add 2 snmp community both "commune" 192.168.100.245`**
The example will allow the host 192.168.100.245 read/write access to the TSR card SNMP agent using the community name "commune". The TSR is located in slot 2.

{rtr_card-addr}

The slot number (1-8) that contains the Router card.

{read|write|both}

both	Will set the community to be read/write
read	Will set the community to be read-only
write	Will set the community to be write-only

{"community-name"}

Name of the community to add with a maximum length of 10 characters. Must be enclosed in quotes.

{ip-addr}

The IP address of the host that can access the SNMP agent via this community, in the form of xxx.xxx.xxx.xxx, where xxx is between 0-255. The address "0.0.0.0" allows any host.

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add (router) snmp trap

Use the **add (router) snmp trap** command to specify a destination to send SNMP trap messages for the specified Router card.

Syntax: **`add {rtr_card-addr} snmp trap {"community-name"} {ip-addr} {"profile-name"}`**

Example: **`add 3 snmp trap "commune" 192.168.100.245 "RemoteAxxius"`**
The example will add a trap destination of 192.168.100.245 on the interface "RemoteAxxius" and use the community name "commune" in the messages. The Router is located in slot 3.

{rtr_card-addr}

The slot number (1-8) that contains the Router card.

{"community-name"}

The community name to use in each trap message, with a maximum of 10 characters.

{ip-addr}

The IP address of the destination trap to add, in the form of xxx.xxx.xxx.xxx, where xxx is between 0-255.

{"profile-name"}

The profile name for the TSR interface that is used to reach this destination. Maximum of 11 characters and this name must be enclosed in quotes.

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add (router) static dns host

Use the **add (router) static dns host** command to add a static DNS host record for resolving a domain name to an IP address if the DNS server cannot provide the information. The DNS resolver will first attempt to resolve the name by querying the configured DNS servers. If this does not yield the information, the DNS resolver will consult this list of static entries. This command will fail if the DNS resolver is not enabled.

Syntax: **`add {rtr_card-addr} static dns host {ip-addr} {"domain-name"}`**

Example: **`add 2 dns host 192.168.100.245 "myhost.some.net"`**
Example will add a static DNS host record with address 192.168.100.245 and domain named "myhost.some.net" on the TSR in slot 2.

{rtr_card-addr}

The slot number (1-8) that contains the Router card.

{ip-addr}

The IP address of the host, in the form of xxx.xxx.xxx.xxx, where xxx is between 0-255.

{"domain-name"}

The domain name of the host. Name must be enclosed in quotes, with a maximum length of 41 characters.

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add (router) uploaduser

Use the **add (router) uploaduser** command to specify a host that is allowed to upload either the configuration or software files to the specified Router card.

Syntax: **`add {rtr_card-addr} uploaduser {code|config|both} {all|ip-addr} {"profile-name"}`**

Example: **`add 3 uploaduser code all "LosAngeles"`**
The example will allow any user to upload the code file from the TSR interface named "LosAngeles". The TSR is located in slot 3.

{rtr_card-addr}

The slot number (1-8) that contains the Router card.

{both|code|config}

both	Will allow user to upload both the code file and the configuration file from the Router
code	Will allow user to upload the code file from the Router
config	Will allow user to upload the configuration file from the Router

{all|ip-addr}

all	Will allow upload from anywhere
ip-addr	The IP address to allow upload boot from. In the form of xxx.xxx.xxx.xxx, where xxx is between 0-255

{"profile-name"}

The name of the remote WAN or LAN profile that can be used for the upload. This name must be enclosed in quotes.

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add (router-lan) filter

Use the **add (router-lan) filter** commands to add filters to the specified LAN interface.

add (router-lan) filter address

Use the **add (router-lan) filter address** command to add an address filter to the table of Layer 2 filters applied to the specified LAN interface.

Syntax: **`add {rtr_lan-addr} filter address {both|dest|source} {mac-addr} {"filter-name"}`**

Example: **`add 2:1 filter address both 0x00e09700e9cd "Server1"`**

{tsr_lan-addr}

The Router address is in the form {slot:port} or {slot "profile-name"}.

slot	The slot number (1-8) that contains the Router card.
port	Port number of the Router.
"profile-name"	The profile name for the Router interface. Name must be enclosed in quotes, with a maximum length of 11 characters.

{both|dest|source}

both	Filter by both source and destination
dest	Filter by destination only
source	Filter by source only

{mac-addr}

The MAC address to add to the learned address table for the LAN, in the form a 6-octet HEX value, 0xxxxxxxxxxx. Please note that the MAC address is preceeded by a 0x.

{"filter-name"}

A symbolic name given to identify a filter rule. This name must be enclosed in quotes, with a maximum of 8 characters.

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add (router-lan) filter custom

Use the **add (router-lan) filter custom** command to add a custom filter to the table of Layer 2 filters applied to the specified LAN interface.

Syntax: **`add {rtr_lan-addr} filter custom {pkt-offset} {mask} {match} {"filter-name"}`**

Example: **`add 2:1 filter custom 16 0xFFFF0000 0x45000000 "MyRule"`**

The example will add a custom layer-2 filter that will match all packets that contain the hex value 4500 at the 16th octet past the MAC header.

{rtr_lan-addr}

The Router address is in the form {slot:port} or {slot "profile-name"}.

slot	Slot number (1-8) that contains the Router card.
port	Port number of the Router.
"profile-name"	The profile name for the Router interface. Name must be enclosed in quotes, with a maximum length of 11 characters.

{pkt-offset}

This field will designate where within a packet (past the MAC header) the system is to begin looking for a matching character string. The offset value range is 0 to 60 bytes. To create a filter for the data in the MAC header, use the address and Protocol filters. See charts on the following page for Ethernet Frame and IP Packet formats.

Note: an offset of 12 will create a Source IP Address filter
an offset of 16 will create a Destination IP Address filter

{mask}

The 32-bit mask to indicate which bits to compare to the match value starting at the offset position. The mask is entered as a 32-bit hexadecimal value (all Fs is exact match FFFFFFFF).

{match}

The 32-bit match value that is used to match the incoming packet. The match value is entered as a 32-bit hexadecimal value.

{"filter-name"}

A symbolic name given to identify a filter rule. This name must be enclosed in quotes, with a maximum of 8 characters.

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Ethernet Frame and IP Packet Format

Ethernet 802.3 (raw) Frame - Datalink Header

6 bytes	6 bytes	2 bytes	46 to 1500 bytes	4 bytes
Dest MAC	Source MAC	Length	"FFF" followed by the data	FCS
----------Datalink (MAC) Header----------			----Data and CRC (Frame Check Sequence)----	

IP Packet Format

Version (4 bits)	Header Length (4 bits)	Type-of-Service (8 bits)	Total Length (16 bits)	
Identification (16 bits)			Flags (3 bits)	Fragment Offset (13 bits)
Time-to-Live (8 bits)		Protocol (8 bits)	Header Checksum (16 bits)	
Source IP Address				
Destination IP Address				
IP Options (+ padding)				
Data portion of Datagram				
---------- 32 Bits ----------				

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add (router-lan) filter protocol

Use the **add (router-lan) filter protocol** command to add a protocol filter to the table of Layer 2 filters applied to the specified LAN interface. Note that you only need to identify either an Ethernet or IEEE value, but not both. The other should be entered as 0.

Syntax: **`add {rtr_lan-addr} filter protocol {ether-type} {ieee-value} {"filter-name"}`**

Example: **`add 2:1 filter protocol 0x0807 0x0 "XNSrule"`**
The example will add a custom layer-2 filter that will match all XNS packets.

{rtr_lan-addr}

The Router address is in the form {slot:port} or {slot "profile-name"}.

slot	Slot number (1-8) that contains the Router card.
port	Port number of the Router.
"profile-name"	The profile name for the Router interface. Name must be enclosed in quotes, with a maximum length of 11 characters.

{ether-type}

This assigned Ethernet value for this protocol. The ether-type is entered as a 16-bit hexadecimal value. **See *Ethernet Protocol Types on page D-6* for protocol number and descriptions.**

{ieee-value}

The assigned IEEE value for this protocol. The IEEE value is the same as the SDAP and SSAP values in a SNAP packet. The match value is entered as a 8-bit hexadecimal value.

{"filter-name"}

A symbolic name given to identify a filter rule. This name must be enclosed in quotes, with a maximum of 8 characters.

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add (router-lan) secondary ip address

Use the **add (router-lan) secondary ip address** command to add a secondary IP address and subnet to the specified LAN interface. The Router will then be capable of routing between the various subnets on the LAN interface or between any of the LAN subnets and any WAN subnet. A maximum of 8 secondary IP addresses can be added to the LAN interface.

Syntax: **`add {rtr_lan-addr} secondary ip address {ip-addr [mask]|ip-addr/bits}`**

Example: **`add 4:1 secondary ip address 192.168.1.1 255.255.255.0`**
The example will add a secondary IP address of 192.168.1.1 and a subnet mask of 255.255.255.0.

To view the secondary IP addresses, use the **show 4:1** command

{rtr_lan-addr}

The Router address is in the form {slot:port} or {slot "profile-name"}.

slot	The slot number (1-8) that contains the Router card.
port	Port number of the Router.
"profile-name"	The profile name for the Router interface. Name must be enclosed in quotes, with a maximum length of 11 characters.

{ip-addr [mask]|ip-addr/bits}

ip-addr	The IP address of the Host to query, in the form of xxx.xxx.xxx.xxx, where xxx is between 0-255.
mask	The mask of the secondary IP address, in the form of xxx.xxx.xxx.xxx, where xxx is between 0-255.
bits	The subnet mask, specified as the number of ones bits in the mask value. Range is between 1-32.

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add (router-lan) static

Use the **add (router-lan) static** commands to add static elements on the specified LAN interface.

add (router-lan) static ip address

Use the **add (router-lan) static ip address** command to add a static IP address to the table of learned addresses on the specified LAN interface. This command is typically used in bridging.

Syntax: **`add {tsr_lan-addr} static ip address {"addr-name"} {ip-addr}`**

Example: **`add 3:1 static ip address "JDoe" 195.168.201.140`**

{rtr_lan-addr}

The Router address is in the form {slot:port} or {slot "profile-name"}.

slot	Slot number (1-8) that contains the Router card.
port	Port number of the Router.
"profile-name"	The profile name for the Router interface. Name must be enclosed in quotes, with a maximum length of 11 characters.

{"addr-name"}

A symbolic name for this static ip address. This name must be enclosed in quotes, with a maximum of 8 characters.

{ip-addr}

The IP address of the learned address table for the LAN, in the form of xxx.xxx.xxx.xxx, where xxx is between 0-255.

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add (router-lan) static ip network

Use the **add (router-lan) static ip network** command to add a static IP network (route) to the specified LAN interface.

Syntax: **`add {rtr_lan-addr} static ip network {ip-addr} {mask} {next-hop-ip-addr} [metric]`**

Example: **`add 3:1 static ip network 195.168.201.0 255.255.255.0 194.120.20.15 3`**

The example will add a static route to 192.168.201.0, with mask 255.255.255.0 and the next hop at 194.120.20.15 and a metric of 3 to the local LAN interface on the Router card in slot 3.

{rtr_lan-addr}

The Router address is in the form {slot:port} or {slot "profile-name"}.

slot	Slot number (1-8) that contains the Router card.
port	Port number of the Router.
"profile-name"	The profile name for the Router interface. Name must be enclosed in quotes, with a maximum length of 11 characters.

{ip-addr}

The IP address of the static IP network to set, in the form of xxx.xxx.xxx.xxx, where xxx is between 0-255.

{mask}

The mask of the static IP network, in the form of xxx.xxx.xxx.xxx, where xxx is between 0-255.

{next-hop-ip-addr}

The IP address of the next hop gateway for this route, in the form of xxx.xxx.xxx.xxx, where xxx is between 0-255.

[metric]

Enter a numeric value indicating the distance from your local network to the destination network. Although this value was originally measured by the number of gateways between the two networks, the number may be modified, either higher or lower, to indicate a desired priority. This field is only used on IP networks. Valid entries range from 1 to 15. (Please note that a value of 1 usually indicates a direct network.)

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add (router-lan) static ipx network

Use the **add (router-lan) static ipx network** command to add a static IPX network (route) to the specified LAN interface.

Syntax: **`add {tsr_lan-addr} static ipx network {network} {hops} {ticks} {next-hop-mac-addr}`**

Example: **`add 3:1 static ipx network 0x11 2 4 0x00e09700e9cd`**
The example will add a static IPX route to network 0x11, a hop count 2, a tick count 4, a next hop Router at MAC address 00:e0:97:00:e9:cd.

{rtr_lan-addr}

The Router address is in the form {slot:port} or {slot "profile-name"}.

slot	Slot number (1-8) that contains the Router card.
port	Port number of the Router.
"profile-name"	The profile name for the Router interface. Name must be enclosed in quotes, with a maximum length of 11 characters.

{network}

The IPX network number in HEX (0x...). This number must be preceeded by 0x.

{hops}

The numeric value (of hops) indicating the distance from your Local (LAN) network to the destination network.

{ticks}

The distance between two networks as measured in time increments (1/18th of a second). Like hops, ticks may be used to designate primary and secondary routes to the same network.

{next-hop-mac-addr}

The MAC address of the next hop Router, in the form a 6-octet HEX value separated by colons, xxxxxxxxxxxx. This number must be preceeded by 0x.

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add (router-lan) static mac address

Use the **add (router-lan) static mac address** command to add a static MAC address to the table of learned addresses on the specified LAN interface. This command is typically used in bridging.

Syntax: **`add {rtr_lan-addr} static mac address {"network-name"} {mac-addr}`**

Example: **`add 3:1 static mac address "JDoe" 0x00e09700e9cd`**
The example will add a static MAC address, 00:e0:97:00:e9:cd named "JDoe", to the tables for the LAN interface on the TSR card in slot 3.

{rtr_lan-addr}

The Router address is in the form {slot:port} or {slot "profile-name"}.

slot	Slot number (1-8) that contains the Router card.
port	Port number of the Router.
"profile-name"	The profile name for the Router interface. Name must be enclosed in quotes, with a maximum length of 11 characters.

{"network-name"}

A symbolic name given to identify this static MAC address. This name must be enclosed in quotes, with a maximum of 7 characters.

{mac-addr}

The MAC address to add to the learned address table for the LAN, in the form a 6-octet HEX value separated by colons, 0xxxxxxxxxxxx. This number must be preceeded by 0x.

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add (router-wan) firewall

Use the **add (router-wan) firewall** command to add a firewall rule to a WAN.

Syntax: **`add {rtr_card-addr} {"wan-name"} firewall {rule-number} {drop|pass} {incoming|inout|outgoing} {alarm|log|nolog} {service} {dest-ip-addr/bits} {src-ip-addr/bits}`**

Example: **`add 3 "LosAngeles" firewall 1 pass incoming nolog http 203.1.21.17/32 0.0.0.0/0`**
The example will add a firewall rule that allows HTTP (TCP port 80) access from any outside host to an inside web server at 203.1.21.17 to the TSR card in slot 3.

{rtr_card-addr}

The slot number (1-8) that contains the Router card.

{"wan-name"}

The WAN interface to modify. The name must be enclosed in quotes.

{rule-number}

Firewall rules are processed in sequence until the first matching rule is found.

{drop|pass}

drop	Do not allow the packet to be forwarded
pass	Allow the packet to be forwarded

{incoming|inout|outgoing}

incoming	Matches packets for sessions originated from an outside host
inout	Matches packets for sessions originated from either an inside or outside host
outgoing	Matches packets for sessions originated from an inside host

{alarm|log|nolog}

alarm	Add an entry to alarm log for packets that match this rule
log	Add an entry to event log for packets that match this rule
nolog	Do not add an entry to the logs for packets that match this rule

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{service}

finger	Display information about users
ftp	File Transfer Protocol
gopher	Document search and retrieval
http	World Wide Web
icmp	Internet Control Message Protocol
nntp	Network News Transfer
ping	ICMP echo request/reply
pop3	Post Office Protocol Version 3
smtp	Simple Mail Transfer
snmp	Simple Network Management Protocol
tcp	Transmission Control Protocol
	port number (0 - 65535) or range
telnet	User interface to remote unit
udp	User Datagram Protocol
	port number (0 - 65535) or range
wais	Wide Area Information Services
protocol	Enter a protocol number. **Note: for list of protocols and numbers see, *Protocol Number in Firewall Filters on page D-2*.** {protocol-number}= number between 0-255 0 = any protocol

{dest-ip-addr/bits}

The destination IP Address and number of significant bits. The IP Address is in the form of xxx.xxx.xxx.xxx, where xxx is between 0-255. The address "0.0.0.0/0" matches any address.

dest-ip-addr	Enter the IP Address of the local device or network that this rule will affect. If you enter the address of a local device, this rule will affect only the session establishments of the local device and the destination address entered in the Remote IP Address/Network field, below. The IP Address is in the form of xxx.xxx.xxx.xxx, where xxx is between 0-255.
bits	Use this field to identify the number of bits, from left to right that will be used to match the IP Address field within the data packet. Range is between 1-32.

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{src-ip-addr/bits}

The destination IP address and number of significant bits. The address "0.0.0.0/0" matches any address.

src-ip-addr	Enter the IP Address of the remote device or network that this rule will affect. If you enter the address of a remote device, this rule will affect only the session establishments of the remote device and the destination address entered in the dest-ip-addr/bits command above. The IP Address is in the form of xxx.xxx.xxx.xxx, where xxx is between 0-255.
bits	Use this field to identify the number of bits, from left to right that will be used to match the IP Address field within the data packet. Range is between 1-32.

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add (router-wan) gre network

Use the **add (router-wan) gre network** command to add a "by network" Generic Route Encapsulation (GRE) tunnel to a WAN.

Syntax: **`add {rtr_card-addr} {"wan-name"} gre network {ip-addr mask|ip-addr/bits} {metric} {remote-ip-addr} {"tunnel-name"}`**

Example: **`add 3 "LosAngeles" gre network 10.0.0.0/8 3 2.2.2.2 "LATunnel"`**

The example will set the WAN interface named "LosAngeles" in slot 3 to pass all packets destined for a host on subnet 10.0.0.0 through a GRE tunnel to 2.2.2.2.

Note: A **set 3 "LosAngeles" gre ip by network** command is required before this command.

{rtr_card-addr}

The slot number (1-8) that contains the Router card.

{"wan-name"}

The WAN interface to modify. The name must be enclosed in quotes.

{ip-addr mask|ip-addr/bits}

ip-addr mask	The IP address and the subnet mask of the IP network to tunnel, each in the form of xxx.xxx.xxx.xxx, where xxx is between 0-255.
ip-addr	The IP Address of the IP network to tunnel, in the form of xxx.xxx.xxx.xxx, where xxx is between 0-255.
bits	The subnet mask, specified as the number of ones bits in the mask value. Range is between 1-32.

{metric}

Enter a numeric value indicating the distance from your local network to the destination network. Valid entries range from 1 to 15.

{remote-ip-addr}

The IP address of the far end of this tunnel, in the form of xxx.xxx.xxx.xxx, where xxx is between 0-255.

{"tunnel-name"}

A symbolic name for this tunnel. Maximum of 12 characters and must be enclosed in quotes.

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add (router-wan) nat bypass

Use the **add (router-wan) nat bypass** command to add subnets to the list of source addresses that will not be subject to NAT translation when passing through a NAT enabled WAN interface.

Syntax: **`add {rtr_card-addr} {"wan-name"} nat bypass {ip-addr mask|ip-addr/bits}`**

Example:

The following example displays the configuration necessary to add two secondary IP subnets to the LAN that do not get NAT translation performed on them when their packets pass through the NAT on the WAN. In this example, packets leaving the "RemoteUnit" WAN whose source IP address in the 10.0.0.0 subnet will be NAT translated to 211.103.55.1 before transmission. Packets leaving the "RemoteUnit" WAN whose source IP address is in the 156.65.0.0 or 201.23.16.0 subnets will be transmitted unmodified.

```
set 1:1 ip address 10.0.0.1 255.0.0.0
add 1:1 secondary ip address 156.65.0.1 255.255.255.0
add 1:1 secondary ip address 201.23.16.1 255.255.255.0
set 1 "RemoteUnit" nat enable
set 1 "RemoteUnit" nat address 211.103.55.1 1
add 1 "RemoteUnit" nat bypass 156.65.0.0. 255.255.0.0
add 1 "RemoteUnit" nat bypass 201.23.16.0. 255.255.255.0
```

{rtr_card-addr}

The slot number (1-8) that contains the Router card.

{"wan-name"}

The WAN interface to modify. The name must be enclosed in quotes.

{ip-addr mask|ip-addr/bits}

ip-addr mask	The IP address and subnet mask or host to bypass the NAT translation, each in the form of xxx.xxx.xxx.xxx, where xxx is between 0-255.
bits	Use this field to identify the number of bits, from left to right that will be used to match the IP Address field within the data packet. Range is between 1-32.

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add (router-wan) static

Use the **add (router-wan) static** commands to add static elements on the specified WAN interface.

add (router-wan) static ip address

Use the **add (router-wan) static ip address** command to add a static IP address to the table of learned addresses on the specified WAN interface. This command is typically used in bridging.

Syntax: **`add {rtr_card-addr} {"wan-name"} static ip address {"name"} {ip-addr}`**

Example: **`add 3 "LosAngeles" static ip address "Pasadena" 195.168.201.140`**
The example will add a static IP address, 192.168.201.140, named "Pasadena" to the tables for the WAN interface named "LosAngeles" on the TSR card in slot 3.

{rtr_card-addr}

The slot number (1-8) that contains the Router card.

{"wan-name"}

The WAN interface to modify. The name must be enclosed in quotes.

{"name"}

A symbolic name to help remember the purpose of this entry. Maximum of 7 characters and must be enclosed in quotes.

{ip-addr}

The IP address to add to the learned address table for the WAN, in the form of xxx.xxx.xxx.xxx, where xxx is between 0-255.

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add (router-wan) static ip network

Use the **add (router-wan) static ip network** command to add a static IP network (route) to the specified WAN interface.

Syntax: **`add {rtr_card-addr} {"wan-name"} static ip network {ip-addr} {mask} {metric}`**

Example: **`add 3 "LosAngeles" static ip network 195.168.201.0 255.255.255.0 3`**

The example will add a static route to 195.168.201.0, with mask 255.255.255.0 and a metric of 3 to the WAN interface named "LosAngeles" on the Router card in slot 3.

{rtr_card-addr}

The slot number (1-8) that contains the Router card.

{"wan-name"}

The WAN interface to modify. The name must be enclosed in quotes.

{ip-addr}

The IP address of the static IP network, in the form of xxx.xxx.xxx.xxx, where xxx is between 0-255.

{mask}

The mask of the static IP network, in the form of xxx.xxx.xxx.xxx, where xxx is between 0-255.

{metric}

A numeric value indicating the distance from your local network to the destination network. Valid entries range from 1 to 15. (Please note that a value of 1 usually indicates a direct network).

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add (router-wan) static ipx network

Use the **add (router-wan) static ipx network** command to add a static IPX network (route) to the specified WAN interface.

Syntax: **`add {rtr_card-addr} {"wan-name"} static ipx network {network} {hops} {ticks}`**

Example: **`add 3 "LosAngeles" static ipx network 0x11 2 4`**
The example will add a static IPX Router to network 0x11, with a hop count of 2 and a tick count of 4 to the WAN interface named "LosAngeles" on the Router card in slot 3.

{rtr_card-addr}

The slot number (1-8) that contains the Router card.

{"wan-name"}

The WAN interface to modify. The name must be enclosed in quotes.

{network}

The IPX network number in HEX (0x...)

{hops}

The numeric value (of hops) indicating the distance from your Local (LAN) network to the destination network.

{ticks}

The distance between two networks as measured in time increments (1/18th of a second). Like hops, ticks may be used to designate primary and secondary routes to the same network. Although both the hops and ticks values are considered when determining routing priority, for Novell networks, the tick value is considered first.

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add (router-wan) static mac address

Use the **add (router-wan) static mac address** command to add a static MAC address to the table of learned addresses on the specified WAN interface. This command is typically used in bridging.

Syntax: **`add {rtr_card-addr} {"wan-name"} static mac address {"name"} {mac-addr}`**

Example: **`add 3 "LosAngeles" static mac address "JDoe" x000e09700e9cd`**
The example will add a static MAC address, 00:e0:97:00:e9:cd named "JDoe" to the tables for the WAN interface named "LosAngeles" on the Router card in slot 3.

{rtr_card-addr}

The slot number (1-8) that contains the Router card.

{"wan-name"}

The WAN interface to modify. The name must be enclosed in quotes.

{"name"}

A symbolic name to help remember the purpose of this entry. This name is a maximum of 7 characters and must be enclosed in quotes.

{mac-addr}

The MAC address to add to the learned address table for the LAN, in the form a 6-octet HEX value, 0xxxxxxxxxxx. Please note that the MAC address is preceeded by a 0x

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add (router-wan) static nat address

Use the **add (router-wan) static nat address** command to add a static NAT bi-directional mapping to the specified WAN interface. This command will fail if NAT is not enabled, if the NAT address specified is in the NAT pool, or if the local or NAT address is not unique within the complete group of static NAT mappings.

Syntax: **`add {rtr_card-addr} {"wan-name"} static nat address {local-ip-addr} {nat-ip-addr}`**

Example: **`add 3 "LosAngeles" static nat address 10.0.0.5 34.56.102.222`**
The example will add a static NAT mapping between local IP address 10.0.0.5 to the public IP address 34.56.102.222 on the WAN interface named "LosAngeles" on the Router card in slot 3.

{rtr_card-addr}

The slot number (1-8) that contains the Router card.

{"wan-name"}

The WAN interface to modify. The name must be enclosed in quotes.

{local-ip-addr}

The IP address of the local IP host, in the form of xxx.xxx.xxx.xxx, where xxx is between 0-255.

{nat-ip-addr}

The NAT public IP address, in the form of xxx.xxx.xxx.xxx, where xxx is between 0-255.

add user

Use the **add user** command to create users with management level access (the highest level) with no password. After adding a user, use the set user command to change the access level and set the password for the new user. See also,set user, delete user.

Syntax: **`add user {"user-name"}`**

Example: **`add user "jsmith"`**
The example has added a new user named jsmith.

{"user-name"}

The user-name is the a user ID to add to the system. Text is a single word, with no blank spaces and must be enclosed in quotes. Maximum of 10 characters.

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alarms

Use the **alarms** command to display the active alarms. The report can be filtered by address, category and/or severity (major, minor, alert). The **alarms** command alone, displays a full alarm report.

Syntax: **`alarms [slot|slot:port|slot:port:channel] [category] [severity]`**

Example: **`alarms a:1`**

```
      Time       Date     Severity  Description
   00:00:10 01/01/2004   Major     A:1:1-DS1 Loss Of Frame
Total=1
```

[slot|slot:port|slot:port:channel]

slot	A for the controller card, or 1-8 for service cards.
port	Port number.
channel	Channel number

[category]

ds1	All DS1 facility alarms
env	Environmental Alarms
equipment	Equipment alarms not related to a DS1 interface
fxs	FXS facility alarms
tsr	TSR facility alarms
v35	V.35 facility alarms

[severity]

alert	Alert alarms (threshold crossing)
critical	Critical alarms
info	Information alarms
major	Major alarms (service effecting)
minor	Minor alarms (non-service affecting)

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clear

User the **clear** command to clear logs, performance data and tables.

clear (ds1)

clear (ds3)

clear key

clear log

clear (ocudp) performance

clear (router) ip address table

clear (router) mac address table

clear (router) performance

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clear (ds1)

Use the **clear (ds1)** command to clear specified DS1 performance data.

Syntax: **`clear {ds1-addr} performance {setting}`**

Example: **`clear a:1 performance all`**
Clears all performance data on DS1 1 (port 1) on the DS1 Controller card.

{ds1-addr}

The Controller DS1 addresses are different on the DS3 and DS1 Controller, however the DS1 address on the services cards does not change with Controller type (DS3 or DS1).

DS1 Address on a DS3 Controller in the form {slot:port:channel}		
	slot	A for the DS3 Controller card.
	port	Port number, range or all.
	ds1 channel	Channel number, range or all.
DS1 Address on a DS1 Controller (DS1 mode) or service cards (with DS1 or DS3 controller) in the form {slot:port}		
	slot	A for the DS1 Controller card (DS1 mode), or 1-8 for service cards.
	port	Port number, range or all.

{setting}

all	Clear all performance data
bes	Clear bes (bursty errored seconds) performance data.
css	Clear css (controlled slip seconds) performance data.
dm	Clear dm (degraded minutes) performance data.
es	Clear es (errored seconds) performance data.
lcv	Clear lcv (line code violations) performance data.
les	Clear les (line errored seconds) performance data.
pcv	Clear pcv (path code violations) performance data.
sefs	Clear sefs (severely errored frame seconds) performance data.
ses	Clear ses (severely errored seconds) performance data.
uas	Clear uas (unavailable seconds) performance data.

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clear (ds3)

Use the **clear (ds3)** command to clear specified DS3 performance data.
Note this command applies only when using a DS3 Controller card.

Syntax: **`clear {ds3-addr} performance {setting}`**

Example: **`clear a:1 performance all`**
Clears all performance data on DS3 1 (port 1) on the Controller card.

{ds3-addr}

DS3 address in the form {slot:port}.

slot	A for the controller card, or 1-8 for service cards.
port	Port number, range or all.

{setting}

all	Clear all performance data
ccv	Clear ccv (C-bit code violations) performance data.
ccvfe	Clear far end ccv (C-bit code violations) performance data.
ces	Clear ces (C-bit errored seconds) performance data.
cesfe	Clear far end ces (C-bit errored seconds) performance data.
cses	Clear cses (C-bit severely errored seconds) performance data.
csesfe	Clear far end cses (C-bit severely errored seconds) performance data.
lcv	Clear lcv (line code violations) performance data.
les	Clear les (line errored seconds) performance data.
pcv	Clear pcv (path code violations) performance data.
pes	Clear pes (P-bit errored seconds) performance data.
pses	Clear pses (P-bit severely errored seconds) performance data.
sefs	Clear sefs (severely errored frame seconds) performance data.
uas	Clear uas (unavailable seconds) performance data.
uasfe	Clear far end uas (unavailable seconds) performance data.

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clear key

Use the **clear key** command to remove a specific keyed feature. To acquire a feature key code, contact Carrier Access Customer Service.

Syntax: `clear [rtr_card-addr] key {"key-code"}`

Example: `clear key "q0B8yma2IsSL+1BarY0u"`

[rtr_card-addr]

The slot number (1-8) that contains the Router card. This optional parameter is used for router specific keyed features.

{"key-code"} - The key code is entered to enable the specific feature.

clear log

Use the **clear log** command to clear the event log. This will clear the log without asking for confirmation.

Syntax: `clear log`

clear (ocudp) performance

Use the **clear (ocudp) performance** command to clear OCU-DP status counters.

Syntax: `clear {ocudp-addr} performance`

Example: `clear 3:1 performance`
Clears status counters on port 1 of the OCU-DP card in slot 3.

{ocudp-addr}

In the form {slot:port}.

slot	Slot number (1-8) that contains the OCU-DP card.
port	Port number, range or all.

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clear (router) ip address table

Use the **clear (router) ip address table** command to flush the learned entries from the IP address table for the specified interface from the specified Router card.

Syntax: **`clear {rtr_card-addr} ip address table ["profile-name"]`**

Example: **`clear 2 ip address table`**
The example will clear all the entries on the IP address table.

{rtr_card-addr}

The slot number (1-8) that contains the Router card.

["profile-name"]

The name for the Router interface profile. This name must be enclosed in quotes, with a maximum of 11 characters.

Note: the profile-name is optional, if not specified the tables for all interfaces will be cleared.

clear (router) mac address table

Use the **clear (router) mac address table** command to flush the learned entries from the MAC address table for the specified interface from the specified TSR card.

Syntax: **`clear {rtr_card-addr} mac address table ["profile-name"]`**

Example: **`clear 2 mac address table "LosAngeles"`**
The example will clear all the entries on the "LosAngeles" interface, MAC address table.

{rtr_card-addr}

The slot number (1-8) that contains the Router card.

["profile-name"]

The name for the Router interface profile. This name must be enclosed in quotes, with a maximum of 11 characters.

Note: the profile-name is optional, if not specified the tables for all interfaces will be cleared.

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clear (router) performance

Use the **clear (router) performance** command to clear the runtime statistics that are displayed by the *status (router) performance* command. This command takes effect immediately.

Syntax: **`clear {rtr_card-addr} performance {all|lan|wan}`**

Example: **`clear 4 performance all`**
The example will clear all of the runtime statistics on the router card in slot 4.

{rtr_card-addr}

The slot number (1-8) that contains the Router card.

{all|lan|wan}

all	Clear both LAN and WAN statistics
lan	Clear the LAN statistics only.
wan	Clear the WAN statistics only.

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connect

Use the **connect** command to create two-way connections between any DS0 channels of the service or controller cards.

Syntax: **`connect {slot:port|slot:port:channel} {slot:port|slot:port:channel}`**
Use the **disconnect** command to delete connections.

Example: **`connect A:2:1-24 3:1`**
Connects all 24 channels on port address #2 (DS1) on the controller card (slot A) to port address #1 V.35 in slot 3.

{slot:port|slot:port:channel}

slot	A for the controller card, or 1-8 for service cards.
port	Port number or range.
channel	Channel number or range, for T1 ports.

Channel Associated Signaling (CAS) Conversions

Cross-connects are done at a DS0 level. The following rules need to be kept in mind while performing cross-connects for the voice cards.

DS0	FXO Analog			
	LS	**GS**	**DPT**	**LSCPD**
T1 DS0				
LS	Y	N	N	Y
GS	N	Y	N	N
EMDW	N	N	N	N
EMI	N	N	Y	N
EMICPD	N	N	N	N
EMW	N	N	N	N

DPT = Dial Pulse Termination
EMDW = E&M Delayed Wink start
EMI = E&M Immediate start
EMICPD = E&M Immediate Start with Calling Party Disconnect
EMW = E&M Wink start
GS = Ground Start
LS = Loop Start
LSCPD = Loop Start Calling Party Disconnect

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connect (router-trunk) (t1)

Use the **connect (router-trunk) (t1)** command to create two-way connections between the Router port trunk connections and any DS0 channels of the service card or Controller.

Syntax: **`connect {rtr_trunk-addr} {slot:port|slot:port:channel}`**

Use the **disconnect** command to delete connections.

Note: addresses can also be in the following order:

`connect {slot:port|slot:port:channel} {rtr_trunk-addr}`

Example: **`connect 5:1:1 a:2:1-12`**

Connects 12 channels on port address #2 (DS1) on the controller card (slot A) to trunk 1 on the Router in slot 5.

{rtr_trunk-addr}

The Router trunk address is in the form {slot:port:trunk} .

slot	The slot number (1-8) that contains the Router card.
port	Port number of the TSR is 1. Note: there are 4 physical ports but only one logical one used for addressing.
trunk	Trunk number for this port, 1-24.

{slot:port|slot:port:channel}

slot	A for the controller card, or 1-8 for service cards.
port	Port number or range (port must be a T1).
channel	Channel number or range, for T1 ports.

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delete

Use the **delete** command to remove users, interfaces, services or profiles.

See the following sections for detailed information on the following **delete** commands

delete (ds1) ais

delete (router) dhcp server option

delete (router) dns proxy

delete (router) remote

delete (router) snmp community

delete (router) snmp trap

delete (router) static dns host

delete (router) uploaduser

delete (router-lan) filter

delete (router-lan) secondary ip address

delete (router-lan) static

delete (router-wan) firewall

delete (router-wan) gre network

delete (router-wan) nat bypass

delete (router-wan) static

delete user

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delete (ds1) ais

Use the **delete (ds1) ais** command to delete DS1s from the AIS DS1 list. The DS1 that is AIS enabled will be checked against the DS1s defined in the list.
Note: If no DS1s are defined, and AIS is enabled, the default will be all the DS1s in the system. If all DS1s are removed from the lit the default of all the DS1s in the system will be applied.

Syntax: `delete {ds1-addr} ais {ds1-addr1}, [ds1-addr2], [ds1-addr3], [ds1-addr4]`

Example: `delete 1:1 ais 2:1`

{ds1-addr}

Enter the DS1 that has AIS enabled.

The Controller DS1 addresses are different on the DS3 and DS1 Controller, however the DS1 address on the services cards does not change with Controller type (DS3 or DS1).

DS1 Address on a DS3 Controller in the form {slot:port:channel}		
	slot	A for the DS3 Controller card.
	port	Port number, range or all.
	ds1 channel	Channel number, range or all.
DS1 Address on a DS1 Controller or service cards (with DS1 or DS3 controller) in the form {slot:port}		
	slot	A for the DS1 Controller card, or 1-8 for service cards.
	port	Port number, range or all.

{ds1-addr1}, [ds1-addr2], [ds1-addr3], [ds1-addr4]

Deletes a DS1 from the AIS DS1 list. The user can delete 1 to 4 DS1s from the list.

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delete (router) dhcp server option

Use the **delete (router) dhcp server option** command to delete optional DHCP server attributes that will be advertised every time a DHCP client discovery is initiated. This provisioning takes effect immediately and can only be performed when the DHCP server is enabled.

Syntax: **`delete {rtr_card-addr} dhcp server option {tag}`**

Example: **`add 2 dhcp server option 13`**

{rtr_card-addr}

The slot number (1-6) that contains the Router (IP, CMG or TSR) card.

{tag}

An existing tag to be removed. Use the *show (router) dhcp* command to see current options.

delete (router) dns proxy

Use the **delete (router) dns proxy** command to remove a remote DNS server address from the specified Router card. If this command is directed to delete the only a DNS proxy server address then DNS proxy is disabled.

Syntax: **`delete {rtr_card-addr} dns proxy {ip-addr}`**

Example: **`delete 2 dns proxy 192.168.100.245`**
The example will delete a DNS proxy server address of 192.168.100.245 from the Router in slot 2.

{rtr_card-addr}

The slot number (1-8) that contains the Router card.

{ip-addr}

The IP address of the external DNS server, in the form of xxx.xxx.xxx.xxx, where xxx is between 0-255.

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delete (router) remote

Use the **delete (router) remote** command to delete a remote WAN profile from the WAN profile table on the specified Router card.

Syntax: **`delete {rtr_card-addr} remote {"profile-name"}`**

Example: **`delete 6 remote "Texas"`**
The example will delete a remote WAN named "Texas" from the WAN profile table for the Router in slot 6.

{rtr_card-addr}

The slot number (1-8) that contains the Router card.

{"profile-name"}

The name of the remote WAN profile to delete. This name must be enclosed in quotes, with a maximum of 12 characters.

delete (router) snmp community

Use the **delete (router) snmp community** command to delete an SNMP community entry on the specified Router card.

Syntax: **`delete {rtr_card-addr} snmp community {"community-name"} {ip-addr}`**

Example: **`delete 2 snmp community "commune" 192.168.100.245`**
The example will delete the previously added SNMP community named "commune" from the TSR in slot 2.

{rtr_card-addr}

The slot number (1-8) that contains the Router card.

{"community-name"}

The name of an existing community with a maximum of 12 characters, enclosed in quotes.

{ip-addr}

The IP address of the host that can access the SNMP agent via this community, in the form of xxx.xxx.xxx.xxx, where xxx is between 0-255. The address "0.0.0.0" allows any host.

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delete (router) snmp trap

Use the **delete (router) snmp trap** command to delete a trap destination from the specified Router card.

Syntax: **`delete {rtr_card-addr} snmp trap {"community-name"} {ip-addr}`**

Example: **`delete 2 snmp trap "commune" 192.168.100.245`**
The example will delete the previously added SNMP community named "commune" from the Router in slot 2.

{rtr_card-addr}

The slot number (1-8) that contains the Router card.

{"community-name"}

The name of an existing community. This name must be enclosed in quotes, with a maximum of 12 characters.

{ip-addr}

The IP address of the destination trap to delete, in the form of xxx.xxx.xxx.xxx, where xxx is between 0-255.

delete (router) static dns host

Use the **delete (router) static dns host** command to delete a static DNS host record.

Syntax: **`delete {rtr_card-addr} static dns host {ip-addr} {"domain-name"}`**

Example: **`delete 2 dns host 192.168.100.245 "myhost.some.net"`**
Example will delete a DNS host entry with address 192.168.100.245 and domain named "myhost.come.net" on the Router in slot 2.

{rtr_card-addr}

The slot number (1-8) that contains the Router card.

{ip-addr}

The IP address of the host, in the form of xxx.xxx.xxx.xxx, where xxx is between 0-255.

{"domain-name"}

The domain name of the host with a maximum length of 41 characters, enclosed in quotes.

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delete (router) uploaduser

Use the **delete (router) uploaduser** command to remove an existing host that is allowed to upload either the configuration or software files to the specified Router card.

Syntax: **`delete {rtr_card-addr} uploaduser {all|ip-addr} {"profile-name"}`**

Example: **`delete 3 uploaduser "LosAngeles"`**
The example will remove any user for upload of a code file from the TSR interface named "LosAngeles". The TSR is located in slot 3.

{rtr_card-addr}

The slot number (1-8) that contains the Router card.

{all|ip-addr}

all	Will delete all upload users.
ip-addr	The IP address of the host, in the form of xxx.xxx.xxx.xxx, where xxx is between 0-255.

{"profile-name"}

The name of the remote WAN or LAN profile specified in the entry to be removed. This name must be enclosed in quotes.

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delete (router-lan) filter

Use the **delete (router-lan) filter** command to delete a single filter rule from the table of Layer 2 filters applied to the specified LAN interface.

Syntax: **`delete {rtr_lan-addr} filter {address|custom|protocol|all} {"filter-name"}`**

Example: **`delete 2:1 filter address "Server1"`**
This example will delete a previously created address filter names "Server1".

{rtr_lan-addr}

The Router address is in the form {slot:port} or {slot "profile-name"}.

slot	Slot number (1-8) that contains the Router card
port	Port number of the Router.
"profile-name"	The profile name for the Router interface. Name must be enclosed in quotes, with a maximum length of 11 characters.

{address|custom|protocol|all}

address	A previously created address filter
custom	A previously created custom filter
protocol	A previously created protocol filter
all	All filter rules. this options does not require a filter-name to follow

{"filter-name"}

A symbolic name given to identify a filter rule. This name must be enclosed in quotes, with a maximum of 8 characters.

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delete (router-lan) secondary ip address

Use the **delete (router-lan) secondary ip address** command to delete a secondary IP address and subnet to the specified LAN interface.

Syntax: **`delete {rtr_lan-addr} secondary ip address {ip-addr [mask]|ip-addr/bits}`**

Example: **`delete 4:1 secondary ip address 192.168.1.1`**
The example will delete a secondary IP address of 192.168.1.1.

{rtr_lan-addr}

The Router address is in the form {slot:port} or {slot "profile-name"}.

slot	The slot number (1-8) that contains the Router card
port	Port number of the Router.
"profile-name"	The profile name for the Router interface. Name must be enclosed in quotes, with a maximum length of 11 characters

{ip-addr [mask]|ip-addr/bits}

ip-addr	The IP address of a current secondary IP address, in the form of xxx.xxx.xxx.xxx, where xxx is between 0-255.
mask	The mask of the secondary IP address, in the form of xxx.xxx.xxx.xxx, where xxx is between 0-255
bits	The subnet mask, specified as the number of ones bits in the mask value. Range is between 1-32.

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delete (router-lan) static

Use the **delete (router-lan) static** commands to delete static elements from the specified LAN interface.

delete (router-lan) static ip address

Use the **delete (router-lan) static ip address** command to delete a static IP address entry from the specified LAN interface.

Syntax: **`add {rtr_lan-addr} static ip address {ip-addr}`**

Example: **`add 3:1 static ip address 195.168.201.140`**

{rtr_lan-addr}

The Router address is in the form {slot:port} or {slot "profile-name"}.

slot	Slot number (1-8) that contains the Router card
port	Port number of the Router.
"profile-name"	The profile name for the Router interface. Name must be enclosed in quotes, with a maximum length of 11 characters

{ip-addr}

The IP address of the learned address table for the LAN, in the form of xxx.xxx.xxx.xxx, where xxx is between 0-255.

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delete (router-lan) static ip network

Use the **delete (router-lan) static ip network** command to delete a static IP network from the specified LAN interface.

Syntax: **`delete {rtr_lan-addr} static ip network {ip-addr} {mask} {next-hop-ip-addr}`**

Example: **`delete 3:1 static ip network 195.168.201.0 255.255.255.0 194.120.20.15`**
The example will delete the existing static IP network from the LAN interface of the Router card in slot 3.

{rtr_lan-addr}

The Router address is in the form {slot:port} or {slot "profile-name"}.

slot	Slot number (1-8) that contains the Router card
port	Port number of the Router.
"profile-name"	The profile name for the Router interface. Name must be enclosed in quotes, with a maximum length of 11 characters

{"profile-name"}

The IP address of the static IP network, in the form of xxx.xxx.xxx.xxx, where xxx is between 0-255.

{ip-addr}

The IP address of the static IP network, in the form of xxx.xxx.xxx.xxx, where xxx is between 0-255.

{mask}

The mask of the static IP network, in the form of xxx.xxx.xxx.xxx, where xxx is between 0-255.

{next-hop-ip-addr}

The IP address of the next hop gateway for this route, in the form of xxx.xxx.xxx.xxx, where xxx is between 0-255.

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delete (router-lan) static ipx network

Use the **delete (router-lan) static ipx network** command to delete a static IPX network (route) to the specified LAN interface.

Syntax: **`delete {rtr_lan-addr} static ipx network {network} {next-hop-ip-addr}`**

Example: **`delete 3:1 static ipx network 0x11 0x00e09700e9cd`**
The example will delete a static IPX route to network 0x11, using a next hop Router at MAC address 00:e0:97:00:e9:cd, from the LAN interface on the Router card in slot 3.

{rtr_lan-addr}

The Router address is in the form {slot:port} or {slot "profile-name"}.

slot	Slot number (1-8) that contains the Router card.
port	Port number of the Router.
"profile-name"	The profile name for the Router interface. Name must be enclosed in quotes, with a maximum length of 11 characters.

{network}

The IPX network number in HEX (0x...).

{next-hop-ip-addr}

The MAC address of the next hop Router, in the form a 6-octet HEX value, in the form 0xxxxxxxxxxxx. Please note the address is preceeded by 0x.

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delete (router-lan) static mac address

Use the **delete (router-lan) static mac address** command to delete a static MAC address entry to the specified LAN interface.

Syntax: **`delete {rtr_lan-addr} static mac address {mac-addr}`**

Example: **`delete 3:1 static mac address 0x00e09700e9cd`**
The example will delete a static MAC address, 00:e0:97:00:e9:cd, from the LAN interface of the Router card in slot 5.

{rtr_lan-addr}

The Router address is in the form {slot:port} or {slot "profile-name"}.

slot	The slot number (1-8) that contains the Router card
port	Port number of the Router.
"profile-name"	The profile name for the Router interface. Name must be enclosed in quotes, with a maximum length of 11 characters

{mac-addr}

The MAC address to add to the learned address table for the LAN, in the form a 6-octet HEX value, 0xxxxxxxxxxx. Note that the MAC address is preceeded by a 0x.

delete (router-wan) firewall

Use the **delete (router-wan) firewall** command to delete a firewall rule from a WAN.

Syntax: **`delete {rtr_card-addr} {"wan-name"} firewall {all|rule-number}`**

Example: **`delete 3 "LosAngeles" firewall all`**
The example will remove all firewalls rules on the Router in slot 3, for the profile "LosAngeles".

{rtr_card-addr}

The slot number (1-8) that contains the Router card.

{"wan-name"}

The WAN interface to modify. The name must be enclosed in quotes.

{all|rule-number}

all	Delete all firewall rules on this WAN
rule-number	The specific firewall rule to delete

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delete (router-wan) gre network

Use the **delete (router-wan) gre network** command to delete a "by network" GRE tunnel to a WAN.

Syntax: **`delete {rtr_card-addr} {"wan-name"} gre network {ip-addr mask|ip-addr/bits}`**

Example: **`delete 3 "LosAngeles" gre network 10.0.0.0/8`**

{rtr_card-addr}

The slot number (1-8) that contains the Router card.

{"wan-name"}

The WAN interface to modify. The name must be enclosed in quotes.

{ip-addr mask|ip-addr/bits}

ip-addr mask	The IP address and the subnet mask of the IP network to tunnel, each in the form of xxx.xxx.xxx.xxx, where xxx is between 0-255.
ip-addr	The IP Address of the IP network to tunnel, in the form of xxx.xxx.xxx.xxx, where xxx is between 0-255.
bits	The subnet mask, specified as the number of ones bits in the mask value. Range is between 1-32.

delete (router-wan) nat bypass

Use the **delete (router-wan) nat bypass** command to delete an IP subnet or host from the list of the source addresses that will not be subject to NAT Translation when passing through a NAT enabled WAN interface.

Syntax: **`delete {rtr_card-addr} {"wan-name"} nat bypass {ip-addr}`**

Example: **`delete 1 "RemoteUnit" nat bypass 156.65.0.0`**

{rtr_card-addr}

The slot number (1-8) that contains the Router card.

{"wan-name"}

The WAN interface to modify. The name must be enclosed in quotes.

{ip-addr}

IP address or host to delete, in the form of xxx.xxx.xxx.xxx, where xxx is between 0-255.

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delete (router-wan) static

Use the **delete (router-wan) static** commands to delete a static element from the WAN interface.

delete (router-wan) static ip address

Use the **delete (router-wan) static ip address** command to delete a static IP address on the specified WAN interface.

Syntax: **`delete {rtr_card-addr} {"wan-name"} static ip address {ip-addr}`**

Example: **`delete 3 "LosAngeles" static ip address 195.168.201.140`**

{rtr_card-addr}

The slot number (1-8) that contains the Router card.

{"wan-name"}

The WAN interface to modify. The name must be enclosed in quotes.

{ip-addr}

The IP address to delete from the WAN, in the form of xxx.xxx.xxx.xxx, where xxx is between 0-255.

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delete (router-wan) static ip network

Use the **delete (router-wan) static ip network** command to delete a static IP network from the specified WAN interface.

Syntax: **`delete {rtr_card-addr} {"wan-name"} static ip network {ip-addr} {mask}`**

Example: **`delete 3 "LosAngeles" static ip network 195.168.201.0 255.255.255.0`**

{rtr_card-addr}

The slot number (1-8) that contains the Router card.

{"wan-name"}

The WAN interface to modify. The name must be enclosed in quotes.

{ip-addr}

IP address of the static IP network, in the form of xxx.xxx.xxx.xxx, where xxx is between 0-255.

{mask}

Mask of the static IP network, in the form of xxx.xxx.xxx.xxx, where xxx is between 0-255.

delete (router-wan) static ipx network

Use the **delete (router-wan) static ipx network** command to delete a static IPX network (route) to the specified WAN interface.

Syntax: **`delete {rtr_card-addr} {"wan-name"} static ipx network {network}`**

Example: **`delete 3 "LosAngeles" static ipx network 0x11`**

{rtr_card-addr}

The slot number (1-8) that contains the Router card.

{"wan-name"}

The WAN interface to modify. The name must be enclosed in quotes.

{network}

The IPX network number in HEX (0x...)

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delete (router-wan) static mac address

Use the **delete (router-wan) static mac address** command to delete a static MAC address entry from the specified WAN interface.

Syntax: **`delete {rtr_card-addr} {"wan-name"} static mac address {mac-addr}`**

Example: **`delete 3 "LosAngeles" static mac address 0x00e09700e9cd`**

{rtr_card-addr}

The slot number (1-8) that contains the Router card.

{"wan-name"}

The WAN interface to modify. The name must be enclosed in quotes.

{mac-addr}

The MAC address to add to the learned address table for the LAN, in the form 0xxxxxxxxxxxx. Please note the address is preceeded by 0x.

delete (router-wan) static nat address

Use the **delete (router-wan) static nat address** command to delete a static NAT mapping from the specified WAN interface.

Syntax: **`delete {rtr_card-addr} {"wan-name"} static nat address {local-ip-addr} {nat-ip-addr}`**

Example: **`delete 3 "LosAngeles" static nat address 10.0.0.5 34.56.102.222`**

{rtr_card-addr}

The slot number (1-8) that contains the Router card.

{"wan-name"}

The WAN interface to modify. The name must be enclosed in quotes.

{local-ip-addr}

IP address of the local IP host, in the form of xxx.xxx.xxx.xxx, where xxx is between 0-255.

{nat-ip-addr}

The NAT public IP address, in the form of xxx.xxx.xxx.xxx, where xxx is between 0-255.

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delete user

The delete user command will remover a user created by the **add user** command.

Syntax: **`delete user {"user-name"}`**

Example: **`delete user "jsmith"`**

{"user-name"}

The user-name is an existing user ID in the system. This name must be enclosed in quotes.

disconnect

disconnect

Remove a connection created using the **connect** command.

Syntax: **`disconnect {slot|slot:port|slot:port:channel|slot:port:trunk}`**

Example: **`disconnect A:2:1-24 3:1`**
Disconnects all 24 channels on port address #2 (DS1) on the controller card (slot A) to port address #1 V.35 in slot 3.

NOTE: The operator can remove connections for all of a slot {slot}, a port within a slot {slot:port}, or for specific channel {slot:port:channel}

{slot|slot:port|slot:port:channel|slot:port:trunk}

slot	A for the controller card, or 1-8 for service cards.
port	Port number or range.
channel	Channel number or range, for T1 ports.
trunk	Trunk number for this port, 1-24.

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exit

Use the **exit** command to log out of the Command Line Interface (CLI).

Syntax: `exit`

Example:
```
> exit
Logging out of Carrier Access - Axxius Product Line
```

install

install (slot) router

The Axxius 800 Controller card automatically creates a backup of the configuration of any router cards in their respective slot. If a router card is removed and replaced with a another card (of the same type) the backup of the configuration from the first occupying card is loaded onto the replacing card. This command will stop this function and the replacing router card will retain its configuration.

Syntax: **`install {number} {cmg|router|tsr}`**

Example: **`install 5 router`**

{number}

The slot number (1-8) of the card to download the software file to.

{cmg|router|tsr}

The router type. **Note: Only the TSR is supported in the this release.**

To replace a router card in slot 5 and retain its loaded configuration file:

1. Remove current router card in slot 5 of the Axxius system.
2. With the CLI command enter:

```
> install 5 router
ok
```

3. When an "ok" is displayed the replacement router card may be inserted into slot 5.

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load

WARNING! BEFORE LOADING A DOWN-LEVEL OF ROUTER CODE TO AN ADIT, SAVE THE CONFIGURATION TO A FILE. CONFIGURATION MAY BE RESET TO THE DEFAULT SETTING AND CURRENT CONFIGURATION LOST.

load tftp

The **load tftp** command will download software via TFTP to the Controller or to the TSR card. Note: A TFTP server must be running on the host system for this command to be successful.

Syntax: `load {ctrlr-id|number} tftp {ip-addr} {"file-name"}`

Example: `load a1 tftp 192.102.3.168 "axxius1_0_all.mgm"`
The example will download the Controller software file "axxius1_0_all.mgm" to the Controller in slot 1, via TFTP.

Example: `load 5 tftp 172.26.100.25 "tsr1_20.mgm"`
The example will download the Router software file "tsr1_20.mgm" to a TSR card in slot 5 via TFTP.

Example: `load 5 tftp 172.26.100.25 "config.txt"`
The load tftp command is modified to add special processing when a filename ends with "txt". In this case, the .txt file is handled as an ASCII file containing CLI commands to configure the Axxius 800.

{ctrlr_id|number}

ctrlr_id	Controller identifier to download the software to. A1, A2 All, Active or Standby. **Note: always load to the standby controller, in a redundant system, reset and switch controllers, then load again to the new standby controller.**
rtr_card-addr	Slot number (1-8) of a Router card to load the software file to.

{ip-addr}

The host IP address in the form of xxx.xxx.xxx.xxx, where xxx is a number from 0-255. If not supplied the host IP address from the database will be used.

{"file-name"}

The software file to load including path. Must be enclosed with quotes.
The file-type of the downloading files must be .mgm, or .txt.

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load xmodem

Use the **load xmodem** command to download software via Xmodem. This command is only available with an RS-232 connection. If you are using Telnet, see *load tftp* command.

Syntax: **`load {ctrlr-id} xmodem`**

Example: **`load a2 xmodem`**
The example initiates an modem transfer to the Controller card in slot A2.

Do you really want to do this?

Enter `Y` at the prompt to continue, or `N` to cancel the download.

`Y` - the system will prompt you to select the appropriate local file. With the file selected, the system will complete the download, reboot, and run the installation for flash upgrade. Screen example following.

```
                    **** System Boot ****
      Copyright 1999,2000 Carrier Access Corporation.
XMODEM transfer started
Validating image(fast).........................SUCCEEDED!
Erasing FLASH:.........................Finished Erasing FLASH!
Erasing FLASH:.........................Finished Erasing FLASH!
Programming Flash.........................SUCCEEDED!
In 5 seconds the system will boot from Flash
Press any key to stop boot . 5 . 4 . 3 . 2 . 1 . 0
Looking for valid application image in Flash...
Executing application image from Flash
Attached TCP/IP interface to cpm unit 0
Attaching interface lo0...done
Axxius startup
```

{ctrlr_id}

ctrlr_id	Controller identifier to download the software to. A1, A2 All, Active or Standby

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log

log

Displays the event log. Where the optional [slot:port:channel], [category], and [severity] are variables used to narrow down the log displayed. The log command without any options displays a full log.

Syntax: **`log [slot|slot:port] [category] [severity]`**

Example: **`log a:1`**

```
  Time      Date     Severity Description
00:00:08 01/01/2002 Major    A:1:28-DS1 Loss Of Frame
00:00:08 01/01/2002 Major    A:1:27-DS1 Loss Of Frame
00:00:08 01/01/2002 Major    A:1:26-DS1 Loss Of Frame
Total=3
```

[slot|slot:port|slot:port:channel]

slot	A for the controller card, or 1-8 for service cards
port	Port number (not a range)
channel	Channel number or range

[category]

slot	A for the controller card, or 1-8 for service cards
port	Port number (not a range)
channel	Channel number or range
slot	A for the controller card, or 1-8 for service cards
port	Port number (not a range)
channel	Channel number or range
slot	A for the controller card, or 1-8 for service cards
port	Port number (not a range)

[severity]

alert	Alert events (threshold crossing)
critical	Critical events
info	Information events
major	Major events (service effecting)
minor	Minor events (non-service affecting)

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ping

ping

Use the **ping** command to perform a ping test from the Controller and report the result. If the host is reachable, each individual response will be displayed.

Syntax: **`ping {ip-addr} [count] [length]`**

Example: **`ping 192.168.3.196 7 5000`**

```
Pinging 192.168.3.196 with 5000 bytes of data:

Reply from 192.168.3.196: bytes=5000 time=90ms
Reply from 192.168.3.196: bytes=5000 time=144ms
Reply from 192.168.3.196: bytes=5000 time=186ms
Reply from 192.168.3.196: bytes=5000 time=90ms
Reply from 192.168.3.196: bytes=5000 time=90ms
Reply from 192.168.3.196: bytes=5000 time=90ms
Reply from 192.168.3.196: bytes=5000 time=90ms

> ping 192.168.10.196 7 5000
PING 192.168.10.196: 5000 data bytes
no answer from 192.168.10.196
```

{ip-addr}

The host IP address of the device to query, in the form of xxx.xxx.xxx.xxx, where xxx is a number from 0-255.

[count]

This optional parameter sets the number of pings to send. Range is 1 to 32, default is 5.

[length]

This optional parameter sets the number of bytes to send in the ICMP echo request payload. Range is 0 to 8000, default is 56.

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print

Use the **print** command to display the help information or print the configuration file.

Syntax: **`print {config|help}`**

print config

Print the configuration file for the Axxius 800. The operator may then save this to a text file, which can be sent to another Axxius to automatically configure the system with the original Axxius 800 configuration.

Syntax: **`print config [rtr_card-addr]`**

[rtr_card-addr] - The slot number (1-8) that contains the Router card.

Example: **`print config 5`**

This example would produce a configuration file of the Router in slot 5.

```
Axxius> print config 5
set verification off
-set 5 password view   {password}  is manual
-set 5 password config {password}  is manual
-set 5 password admin  {password}  is manual
-set 5 enhanced security enable     is manual
-set 5 password security {password} is manual
delete 5 remote "RemoteUnit"
set 5 stp enable
rename 5 "LocalUnit" "LocalAxxius"
set 5:1 ip address 192.168.3.195 255.255.255.0
add 5:1 secondary ip address 192.168.3.194 255.255.255.0
set 5:1 up
set 5:1 collision threshold high 500
add 5 remote "RemoteUnit"
reset 5
```

Example: **`print config`**

This example would produce a configuration file of the Controller.

1. While in a Telnet session to an Adit 600 select Terminal/Start Logging.
2. Name the file.
3. Type the CLI command **`print config.`**
4. Select Terminal/Stop Logging.

See *Load Controller Configuration on page 18-10* for instructions to reload configuration to Controller card.

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print help

Print the complete help file to the screen.

Syntax: **`print help`**

Example: **`print help`**
This example would print the entire help text, which can be scrolled though with **Enter** or **Spacebar**.

rename (router)

Use the **rename (router)** command to change the name of a local LAN or remote WAN profile on the specified Router card. Profile names cannot contain spaces and must be unique on a particular TSR card.

Syntax: **`rename {rtr_card-addr} {"old-profile-name"} {"new-profile-name"}`**

Example: **`rename 6 "Chicago" "Milwaukee"`**
This example will change the name of the WAN profile from "Chicago" to "Milwaukee", for the Router in slot 6.

{rtr_card-addr}

The slot number (1-8) that contains the Router card.

{"old-profile-name"}

The current LAN or WAN profile name. This name must be enclosed in quotes.

{"new-profile-name"}

The new profile name of a LAN or WAN profile. This name has a maximum length of 11 characters, and must be enclosed in quotes.

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reset

reset (controller)

Use the **reset (controller)** command to reboot the system. Reset alone will reboot the entire system.

Syntax: **`reset [ctrlr-addr|active|standby]`**

Example: **`reset a1`**
Will reset the controller in the controller slot 1.

```
Do you really want to reset (y/n)? y

                  **** System Boot ****
Copyright 1999,2000 Carrier Access Corporation.
```

{ctrlr_card-addr|active|standby}

ctrlr_card-addr	Resets the Controller in the defined slot number (a1 or a2)
active	Resets the active Controller
standby	Resets the standby Controller

WARNING! ***THE COMMANDS*** **reset AND reset active ARE SERVICE AFFECTING COMMANDS.**

reset (router)

Use the **reset (router)** command to reboot the Router. All new configuration since the last reset will be in use.

Syntax: **`reset {rtr_card-addr}`**

Example: **`reset 1`**
The example will reset the Router card in slot 1.

```
Do you really want to do this ?   y
OK
```

{rtr_card-addr}

The slot number (1-8) that contains the Router card.

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reset (router) coldboot

Use the **reset (router) coldboot** command to reboot the Router. This will reboot including a power cycle to the Router card.

Syntax: **`reset {rtr_card-addr} coldboot`**

Example: **`> reset 2 coldboot`**
OK

The example will coldboot the Router card in slot 2.

{rtr_card-addr}

The slot number (1-8) that contains the Router (TSR) card.

restore

Use the **restore** command to restore system properties.

Note: to restore Router defaults see *set (router) default*.

restore defaults

Loads factory defaults for all settings. This command will not take effect until the system is rebooted using the **reset** command.

Syntax: **`restore defaults`**

Example: **`restore defaults`**

```
For the restore default changes to take effect send a reset command.
Further configuration changes made before a reset will be lost.
```


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rtrping

Use the **rtrping** command to request that the Router perform a ping test and report the result.

Syntax: **rtrping {rtr_card-addr} {dest-ip-addr|"domain-name"} [count] [count length] [count length source-ip-addr]**

Example: **rtrping 4 192.168.100.97**

```
> rtrping 4 192.168.100.97
Pinging 192.168.100.97 with 56 bytes of data:

Reply from 192.168.100.97: bytes=56 time<10ms
Reply from 192.168.100.97: bytes=56 time<10ms
Reply from 192.168.100.97: bytes=56 time<10ms
Reply from 192.168.100.97: bytes=56 time<10ms
Reply from 192.168.100.97: bytes=56 time<10ms

> rtrping 4 192.168.103.239
Pinging 192.168.103.239 with 56 bytes of data:
```

{rtr_card-addr}

The slot number (1-8) that contains the Router card.

{dest-ip-addr|"domain-name"}

dest-ip-addr	The IP Address of the IP network to tunnel, in the form of xxx.xxx.xxx.xxx, where xxx is between 0-255.
"domain-name"	The domain name to use for this query, with a maximum of 43characters, enclosed in quotes. Example: rtrping 3 "www.carrieraccess.com"

[count]

This optional parameter sets the number of pings to send. Range is 1 to 32, default is 5.

[length]

This optional parameter sets the number of bytes to send in the ICMP echo request payload. Range is 0 to 8000, default is 56.

{source-ip-addr}

Override the IP address that will be used as the source IP address in the ICMP echo request, must be one of the Router interface IP addresses. Default is to use the IP address of the interface from which the ping is sent. The IP address, in the form of xxx.xxx.xxx.xxx, where xxx is a number from 0-255.

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set

set alarms
set autoexit
set (bri)
set (bri) mode
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set cclabel
set clock
set clock (1 and 2)
set date
set (ds0)
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set (ds1 card)
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set ethernet ip address
set external alarm
set (fxo)
set (fxsPS or fxsPSM)
set id
set idle
set ip gateway
set ipds0
set key
set login auth
set login support
set lsbackup
set lsprotect enable/disable
set lsprotect manual
set lsprotect nonrevertive
set lsprotect remove
set lsprotect revertive
set (ocudp) baud
set (ocudp) loopback
set (ocudp) loopdetect
set (ocudp) mvec
set (ocudp) secondary
set (ocudp) selftest
set (ocudp) up/down
set (router) autologout
set (router) default
set (router) dhcp
set (router) dns
set (router) enhanced security
set (router) lmi
set (router) lmi poll
set (router) login auth
set (router) login prompt
set (router) ntp
set (router) password
set (router) port
set (router) ppp auth
set (router) ppp security
set (router) proxy
set (router) reboot
set (router) rip
set (router) snmp
set (router) stp
set (router) syslog
set (router-lan) filter forward
set (router-lan) framing
set (router-lan) gateway

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set (router-lan) ip address
set (router-lan) ipx network
set (router-lan) phy
set (router-lan) rip
set (router-lan) stp
set (router-lan) up/down
set (router-trunk) encapsulation
set (router-trunk) multilink group
set (router-trunk) speed
set (router-trunk) up/down
set (router-wan) dlci
set (router-wan) gre
set (router-wan) ip
set (router-wan) ip address
set (router-wan) ipx
set (router-wan) nat
set (router-wan) other
set (router-wan) ppp
set (router-wan) rip
set (router-wan) stp
set (router-wan) trunk
set (router-wan) up/down
set screen
set snmp
set time
set user
set (v35)
set (v54)
set verification

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set alarms

Use the **set alarms** to manually set an alarm state for testing.

Syntax: **`set alarms {critical|major|minor} {off|on}`**

Example: **`set alarms critical on`**
The example set the alarm state of critical on.

{ciritical|major|minor}

critical	Sets a critical alarm
major	Sets a major alarm.
minor	Sets a minor alarm.

{off|on}

off	Disables the alarm state.
on	Enable the alarm state.

set autoexit

Use the **set autoexit** to set the autoexit feature.

Syntax: **`set autoexit {off|on}`**

Example: **`set autoexit on`**
The example will enable the auto-exit feature.

{off|on}

off	Turn off the automatic logout option.
on	Enable the automatic exit option. Users will be automatically logged off after 20 minutes of inactivity.

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set (bri)

Use the **set (bri)** command to setup the ISDN BRI card.

Syntax: **`set {bri-addr} {day|hour} {es|ses} {value}`**

Example: **`set 3:4 threshold day ses 30`**
To set the daily threshold to 30 Severely Errored Seconds on port 4 of a BRI card in slot 3.

{bri-addr}

The {slot:port} address of the BRI card you want to apply the changes to.

slot	A for the controller card, or 1-8 for service cards.
port	Port number or range.

{setting}

crv

Set the Call Reference Value, when the BRI is set to 4:1 mode (lt4to1tdm). The CRV value is between 1-768. **Note: The CRV value for the BRI ports MUST be set the same by both the Axxius 800 and the Access Navigator.**

down

Take the ISDN line Out-of-Service.

threshold

Set the defect thresholds for ISDN lines to one of the following:

day	Set the thresholds for the daily intervals.	
	es	Set the threshold for Errored Seconds (ES)
	ses	Set the threshold for Severely Errored Seconds (SES)
hour	Set the thresholds for hourly intervals.	
	es	Same as above
	ses	Same as above
value	Range is 1 - 65535 seconds.	

up

Put the ISDN line In-Service.

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set (bri) mode

Use the **set (bri) mode** command to set the mode for the ISDN BRI Service.

Syntax: **`set {bri_card-addr} mode {setting}`**

Example: **`set 4 mode nt3ds0`**
To set the BRI card in slot 4 to use 3 DS0 LUNT

{bri_card-addr}

The slot number (1-8) of the Adit chassis that contains the BRI card.

{setting}

lt3ds0	Set the BRI card mode to 3 DS0 LULT, used primarily for a subscriber line.
nt3ds0	Set the BRI card mode to 3 DS0 LUNT, used primarily for a central office connection.

set (bri) pmsync

Use the **set (bri) pmsync** command to set the source for performance monitoring synchronization.

Syntax: **`set {bri_card-addr} pmsync {setting}`**

Example: **`set 4 pmsync axxius`**
To set the BRI card in slot 4 source for performance monitoring synchronization to Axxius.

{bri_card-addr}

The slot number (1-8) that contains the BRI card.

{setting}

Set the operating mode to one of the following:

axxius	Set source to the Axxius
switch	Set source to the switch

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set cclabel

Use the **set cclable** command to set a user defined cross-connect label.

Syntax: **`set cclabel {addr} {"label"}`**

Example: **`set cclabel a:1:1 "Idle Ch"`**
The example will set a user connect label "Idle Ch" on the DS0 a:1:1.

{addr}

ds0-addr	In the form of {slot:port|slot:port:channel}.
fxsPS-addr	In the form of {slot:port}.
fxsPSM-addr	In the form of {slot:port}.
tsr_trunk-addr	In the form of {slot:port:channel}.
v35-addr	In the form of {slot:port}.

{label}

The user defined label can be up to 8 characters, and must be enclosed in quotes.

set clock

Use the **set clock** command to configure signal clock switching.

Syntax: **`set clock {nonrevertive|revertive|switch}`**

Example: **`set clock nonrevertive`**
The example set the signal clock to nonrevertive mode.

{nonrevertive|revertive|switch}

nonrevertive	Nonrevertive mode, meaning that the clock will not switch back to a recently failed clock once that clock is restored
revertive	Revertive mode, the clock will automatically switch back and forth, if possible, to a known good clock signal source
switch	Force a signal clock switch-over. Allows the user to manually switch from the primary clock to the secondary clock, and vice versa. Clock source must be healthy for a switch to take place. This command is not valid in revertive mode.

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set clock (1 and 2)

Use the **set clock (1 and 2)** command to set the master transmit clock. The primary master clock source may be used to clock each DS1 transmitter. The clock circuit automatically switches to the secondary clock source if the primary clock fails.

Syntax: **`set {clock1|clock2} {source}`**

Example: **`set clock1 a:1`**
To set the primary master clock source to A:1.

Example: **`set clock2 1:2`**
Set the secondary master clock source to Quad T1 in slot 1 source selected.

{clock1}

Set primary master transmit clock source.

{clock2}

Set secondary master transmit clock source.

{source}

Set the clock source to one of the following:

bits1_t1	Select BITS1 T1
bits2_t1	Select BITS2 T1
bri-addr	Clock recovered from the BRI port on the BRI card (BRI card must be in LUNT and 3DS0 mode)
ds1-addr	Clock recovered from the DS1 receiver
internal	Internal stratum 4E oscillator

NOTE: To set DS3 clocking see *set (ds3) clock* command.

set date

Use the **set date** command to set the date.

Syntax: **`set date {mm/dd/yyyy}`**

Example: **`set date 1/1/2002`**
The example will set the date to January 1, 2002.

{mm/dd/yyyy}

mm	Represents the month. Range is 1-12, single digits can be entered.
dd	Represents the Day. Range is 1-31, single digits can be entered.
yyyy	Represents the year. Range is 1999-2106.

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set (ds0)

Use the **set (ds0)** command to setup one or all DS0s in a DS1. The command specifies DS0 or range of DS0s, and the setting to apply.

set(ds0) signal

Use the **set (ds0) signal** command to setup one or all DS0s in a DS1 signal.

Syntax: **`set {ds0-addr} signal {emdw|emi|emicpd|emw|gs|ls}`**

Example: **`set a:1:1-4 signal emi`**
To set the signal type to E&M immediate start for channels 1-4, port 1, slot A on a DS1 Controller.

{ds0-addr}

The Controller DS0 addresses are different on the DS3 and DS1 Controller, however the DS0 address on the service cards does not change with Controller type (DS3 or DS1).

DS0 Address on a DS3 Controller in the form {slot:port:channel:sub-channel}

	slot	A for the DS3 Controller card.
	port	Port number, range or all.
	ds1 channel	DS1 channel number, range or all.
	ds0 channel	DS0 channel number, range or all.

DS0 Address on a DS1 Controller or service cards (with DS1 or DS3 controller) in the form {slot:port:channel}

	slot	A for the DS1 Controller card, or 1-8 for service cards.
	port	Port number, range or all.
	channel	Channel number, range or all.

`{emdw|emi|emicpd|emw|gs|ls}`

emdw	E&M delayed wink start. Used for ANI/DNS
emi	E&M immediate start with ringback (used for D3 PLAR and DPT)
emicpd	E&M immediate start with calling party disconnect with ringback
emw	E&M wink start
gs	Ground start signaling
ls	Loop start signaling

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set(ds0) type

Use the **set (ds0) type** command to setup one or all DS0s in a DS1 signal type.

Syntax: **`set {ds0-addr} type {data|voice}`**

Example: **`set 3:1:1-4 type voice`**
To set the traffic type to voice on channels 1-4 on port 1 of slot 3 on a service card.

{ds0-addr}

The Controller DS0 addresses are different on the DS3 and DS1 Controller, however the DS0 address on the service cards does not change with Controller type (DS3 or DS1).

DS0 Address on a DS3 Controller in the form {slot:port:channel:sub-channel}		
	slot	A for the DS3 Controller card.
	port	Port number, range or all.
	ds1 channel	DS1 channel number, range or all.
	ds0 channel	DS0 channel number, range or all.
DS0 Address on a DS1 Controller or service cards (with DS1 or DS3 controller) in the form {slot:port:channel}		
	slot	A for the DS1 Controller card, or 1-8 for service cards.
	port	Port number, range or all.
	channel	Channel number, range or all.

{data|voice}

data	Set the DS0 up to carry data (clear channel)
voice	Set the DS0 up to carry voice traffic (robbed-bit signaling)

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set (ds1)

Use the **set (ds1)** command to set up DS1 interfaces. The command specifies a range of interfaces and the setting to apply.

Syntax: **`set {ds1-addr} {setting}`**

Example: **`set a:1 framing esf`**
To set DS1 1 (port 1) on a DS1 Controller to use ESF framing.

{ds1-addr}

The Controller DS1 addresses are different on the DS3 and DS1 Controller, however the DS1 address on the services cards does not change with Controller type (DS3 or DS1). \

DS1 Address on a DS3 Controller in the form {slot:port:channel}		
	slot	A for the DS3 Controller card.
	port	Port number, range or all.
	ds1 channel	Channel number, range or all.
DS1 Address on a DS1 Controller or service cards (with DS1 or DS3 controller) in the form {slot:port}		
	slot	A for the DS1 Controller card, or 1-8 for service cards.
	port	Port number, range or all.

{setting}

ais	Enable/Disable AIS Forwarding on the DS1. Default is Disabled	
down	Set the DS1 as Out-of-Service	
equipment	Set equipment loopback on the DS1	
	loopdown	Disable equipment loopback on the DS1
	loopup	Enable equipment loopback on the DS1
fdl	Set the Facilities Data Link (FDL) capabilities	
	none	Disable FDL output messages
	t1403	Enable T1.403 FDL performance messages
framing	Set the DS1 framing type to one of the following:	
	d4	To D4 Superframe (SF) framing
	esf	To Extended Superframe (ESF) framing

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id	Set the DS1 circuit identification name. This is the same as dsx1Circuit Identifier from DS1 MIB transmission vendor's identification. String text must be enclosed in quotes. Example: set {ds1-addr} id {"id-name"} {id-name} = transmission vendor's ID, up to 30 characters, in quotes.	
lbo	Set the Line Build Out (LBO) to one of the following: **Note: this options is not applicable on a DS1 within a DS3.**	
	1	DSX-1 equalization for 0-133 feet (equivalent to CSU attenuation for LBO of 0dB)
	2	DSX-1 equalization for 133-266 feet
	3	DSX-1 equalization for 266-399 feet
	4	DSX-1 equalization for 399-533 feet
	5	DSX-1 equalization for 533-655 feet
	6	CSU attenuation for LBO of -7.5dB
	7	CSU attenuation for LBO of -15dB
	8	CSU attenuation for LBO of -22.5dB
line	Turn a line loopback to the DS1 interface on or off. If the line command is not used, the default for line loopback is loopdown.	
	loopdown	Disable the line loopback
	loopup	Enable a DS1 line loopback toward the DS1 drop
linecode	Set the DS1 interface line coding to one of the following. If the linecode command is not used, the default for linecode is B8ZS. **Note: this options is not applicable on a DS1 within a DS3.**	
	ami	Alternate Mark Inversion line coding
	b8zs	Binary 8 Zero Substitution line coding.
loopdetect	Enable detection of CSU loop code (10000 - loopup; 100 - loopdown)	
	on	Enable detection
	off	Disable detection
payload	Apply a payload loopback to the DS1 interface. If the payload command is not used, the default for payload loopback is loopdown.	
	loopdown	Disable the payload loopback
	loopup	Enable the payload loopback

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threshold	Set default thresholds for a DS1. Defaults for all are 0.	
	day	Set threshold for a daily interval
	bes	Bursty errored seconds range: 0 - 86400
	css	Controlled slip seconds range: 0 - 86400
	dm	Degraded minutes range: 0 - 1440
	es	Errored seconds range: 0 - 86400
	lcv	Line code violations range: 0 - 133401600
	les	Line errored seconds range: 0 - 86400
	pcv	Path code violations range: 0 - 133401600
	sefs	Severely errored frame seconds range: 0 - 86400
	ses	Severely errored seconds range: 0 - 86400
	uas	Unavailable seconds range: 0 - 86400
	min15	Set threshold for a 15 minute interval
	bes	Bursty errored seconds range: 0 - 900
	css	Controlled slip seconds range: 0 - 900
	dm	Degraded minutes range: 0 - 15
	es	Errored seconds range: 0 - 900
	lcv	Line code violations range: 0 - 1389600
	les	Line errored seconds range: 0 - 900
	pcv	Path code violations range: 0 - 1389600
	sefs	Severely errored frame seconds range: 0 - 900
	ses	Severely errored seconds range: 0 - 900
	uas	Unavailable seconds range: 0 - 900
up	Set the DS1 as In-Service. Enables alarm reporting (and LED) for the port specified	

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set (ds1 card)

Use the **set (ds1 card)** commands to configure DS1 card types. These commands apply to the Quad DS1/E1 (hardened) and Quad DS1 ADPCM (hardened) service cards.

set (ds1 card) spantype

Use the **set (ds1 card) spantype** command to set the span type (T1 or E1) on the DS1 type card. **Note: this CLI command is not supported in this release.**

Syntax: `set {ds1_card-addr} {e1span|t1span}`

Example: `set 6 e1span`
To set the Quad DS1/E1 card in slot 6 to E1 mode.

{ds1_card-addr}

The slot number (1-6) that contains a DS1 type card (Quad DS1/E1 or Quad DS1 ADPCM service card).

{e1span|t1span}

e1span	Enables E1 capability on this card.
t1span	Enables T1 capability on this card. (Default)

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set (ds1 card) adpcm map

Use the **set (ds1 card) adpcm map** command to set voice compression map on the Quad DS1 ADPCM card.

Syntax: `set {adpcm_card-addr} adpcm {none|map1|map2|map3}`

Example: `set 5 adpcm map1`

{adpcm_card-addr} - The slot number (1-6) that contains the Quad DS1 ADPCM card.

{none|map1|map2|map3}

none	None will disable compression on the card. Default.
map1, map2 or map3	Map setting, see chart below

	MAP 1		MAP 2		MAP 3	
DS0	**X-Port**	**Backplane**	**X-Port**	**Backplane**	**X-Port**	**Backplane**
Number	**Analog**	**Bus**	**Analog**	**Bus**	**Analog**	**Bus**
1	**32n**	**X1/2**	**32n**	**X1/2**	**32n**	**X1/2**
2	**32n**	**X3/4**	**32n**	**X3/4**	**32n**	**X3/4**
3	**32n**	**X5/6**	**32n**	**X5/6**	**32n**	**X5/6**
4	**32n**	**X7/8**	**32n**	**X7/8**	**32n**	**X7/8**
5	**32n**	**X9/10**	**32n**	**X9/10**	**32n**	**X9/10**
6	**32n**	**X11/12**	**32n**	**X11/12**	**32n**	**X11/12**
7	**32n**	**X14/15**	**32n**	**X13/14**	**32n**	**X13/14**
8	**32n**	**X16/17**	**32n**	**X15/16**	**32n**	**X15/16**
9	**32n**	**X18/19**	**32n**	**X17/18**	**32n**	**X17/18**
10	**32n**	**X20/21**	**32n**	**X19/20**	**32n**	**X19/20**
11	**32n**	**X22/23**	**32n**	**X21/22**	**32n**	**X21/22**
12	**32n**	**X24**	**32n**	**X23/24**	**32n**	**X24**
13	**-**	**Not Avail**	**32n**		**32n**	
14	**32n**		**32n**		**32n**	
15	**32n**		**32n**		**32n**	
16	**32n**		**32n**		**32n**	
17	**32n**		**32n**		**32n**	
18	**32n**		**32n**		**32n**	
19	**32n**		**32n**		**32n**	
20	**32n**		**32n**		**32n**	
21	**32n**		**32n**		**32n**	
22	**32n**		**32n**		**32n**	
23	**32n**		**32n**		**-**	**Not Avail**
24	**64n**		**32n**		**64n**	

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set (ds3)

Use the **set (ds3)** command to set up DS3 interfaces. The command specifies a range of interfaces and the setting to apply.

Syntax: **`set {ds3-addr} {setting}`**

Example: **`set a:1 framing m23`**
To set DS3 1 (port 1) on a DS3 Controller (slot A) to use M23 framing.

{ds3-addr}

DS3 address in the form {slot:port}.

slot	A for the controller card, or 1-8 for service cards.
port	Port number, range or all.

{setting}

down	Set the DS3 as Out-of-Service	
up	Set the DS3 as In-Service. Enables alarm reporting (and LED) for the port specified	
berthreshold	Set Bit Error Rate protection switchover threshold.	
	{value}	4-8 for 10e-4 to 10e-8
clock	Set the transmit clock source	
	loop	Set to clock recovered from the DS3 receive
	normal	Set to master transmit clock source
dejitter	Turn the De-jitter buffer on or off	
	off	De-jitter buffer off
	on	De-jitter buffer on
equipment	Set equipment loopback on the DS3 or PMDL (Path Maintenance Data Link) ID	
	id	Set the DS3 equipment PMDL ID string **Command syntax: set {ds3-addr} equipment id {"string"}** {"string"} = transmission vendor's identification, up to 30 characters, enclosed in quotes.
	loopdown	Disable equipment loopback on the DS3
	loopup	Enable equipment loopback on the DS3
facility id	Set the DS3 facility PMDL ID string **Command syntax: set {ds3-addr} facility id {"string"}** {"string"} = transmission vendor's identification, up to 38 characters, enclosed in quotes.	

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frame	Set the DS3 frame PMDL ID string **Command syntax: set {ds3-addr} frame {"string"}** {"string"} = transmission vendor's identification, up to 10 characters, enclosed in quotes.	
framing	Set the DS3 framing type	
	cbit	To C-bit framing
	m23	To M23 framing
gennum	Set the DS3 generator number PMDL string **Command syntax: set {ds3-addr} gennum {"string"}** {"string"} = transmission vendor's identification, up to 38 characters, enclosed in quotes.	
id	Set the DS3 ID. **Command syntax: set {ds3-addr} id {"id-name"}** {"id-name"} = up to 30 characters, enclosed in quotes.	
line	Set a line loopback on the DS3.	
	loopdown	Disable loopback on the DS3
	loopup	Enable loopback on the DS3
location id	Set the DS3 location PMDL ID string **Command syntax: set {ds3-addr} location id {"string"}** {"string"} = transmission vendor's identification, up to 11 characters, enclosed in quotes.	
loopdetect	Set detection of loopback requests	
	off	Disable detection of loopback requests
	on	Enable detection of loopback requests
payload	Set the payload loopback on the DS3	
	loopdown	Disable the payload loopback
	loopup	Enable the payload loopback
portnum	Set the DS3 port number PMDL string **Command syntax: set {ds3-addr} portnum {"string"}** {"string"} = transmission vendor's identification, up to 38 characters, enclosed in quotes.	
protect	Set port protection on the DS3	
	off	Disable port protection of loopback requests
	on	Enable port protection of loopback requests

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reversion	Set protection reversion on the DS3	
	off	Disable protection reversion of loopback requests
	on	Enable protection reversion of loopback requests
threshold	Set defect thresholds for a DS3. Defaults for all are 0.	
	day	Set threshold for a daily interval
	ccv	C-bit code violation range: 0 - 86400
	ces	C-bit errored seconds range: 0 - 86400
	cses	C-bit severely errored seconds range: 0 - 86400
	lcv	Line code violations range: 0 - 133401600
	les	Line errored seconds range: 0 - 86400
	pcv	Path code violations range: 0 - 133401600
	pes	P-bit errored seconds range: 0 - 86400
	pses	P-bit severely errored seconds range: 0 - 86400
	sefs	Severely errored frame seconds range: 0 - 86400
	uas	Unavailable seconds range: 0 - 86400
	min15	Set threshold for a 15 minute interval
	ccv	C-bit code violation range: 0 - 86400
	ces	C-bit errored seconds range: 0 - 86400
	cses	C-bit severely errored seconds range: 0 - 86400
	lcv	Line code violations range: 0 - 133401600
	les	Line errored seconds range: 0 - 86400
	pcv	Path code violations range: 0 - 133401600
	pes	P-bit errored seconds range: 0 - 86400
	pses	P-bit severely errored seconds range: 0 - 86400
	sefs	Severely errored frame seconds range: 0 - 86400
	uas	Unavailable seconds range: 0 - 86400
unit	Set the DS3 unit code PDML string **Command syntax: set {ds3-addr} unit {"string"}** {"string"} = transmission vendor's identification, up to 6 characters, enclosed in quotes.	

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set ethernet ip address

Use the **set ethernet ip address** command to set the Ethernet address for the Axxius 800.

Syntax: **`set ethernet ip address {ip-addr} [mask]`**

Example: **`set ethernet ip address 172.26.100.25 255.255.255.0`**

{ip-addr}

Set the IP address for the Axxius 800, using the form xxx.xxx.xxx.xxx, where xxx is a number from 0 to 255.

[mask]

Set the subnet mask, using the form xxx.xxx.xxx.xxx, where xxx is a number from 0 to 255. This is an optional setting.

set external alarm

Use the **set external alarm** command to set the external alarm inputs.

Syntax: **`set external alarm {alarm-num} {[severity]|[description]}`**

Example: **`set external alarm 1 "test"`**
The example will set the external alarm #1 description name to "test".

Example: **`set external alarm 2 major`**
The example will set the external alarm #2 severity level to major.

Example: **`set external alarm 3 critical "test2"`**
The example will set the external alarm #3 severity level to critical, with a description name of "test2".

{alarm-num}

Set the alarm number to configure, range is 1-10.

[severity]

Set the alarm severity level to the following:

critical	Set the external alarm severity level to critical
info	Set the external alarm severity level to information
minor	Set the external alarm severity level to minor
major	Set the external alarm severity level to major

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set (fxo)

Use the **set (fxo)** command to setup one or all of the voice channels of an FXO card. The command specifies the list of voice channels within that card, and the setting to apply.

Syntax: **`set {fxo-addr} {setting}`**

Example: **`set 2:1 signal ls`**
Set the FXO on slot 2, port 1 to signaling type loop start.

{fxo-addr}

List of voice channels to apply setting to, in the form {slot:port}.

slot	Slot number 1-8, location of the FXO card
port	Port number or range

{setting}

rxgain	The receive level range is -9 to +7 (db). Available values are -9, -7, -6, -5, -4, -3, -2, 0, 2, 3, 4, 5, 6, and 7	
signal	Set the DS0 signaling type	
	dpt	Set the DS0 to Dial Pulse Terminate
	gs	Set the DS0 to Ground Start signaling
	ls	Set the DS0 to Loop Start signaling
	lscpd	Set the DS0 to Loop Start Calling Party Disconnect
txgain	The transmit level range is -9 to +7 (db). Available values are -9, -7, -6, -5, -4, -3, -2, 0, 2, 3, 4, 5, 6, and 7	

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set (fxsPS or fxsPSM)

Use the **set (fxsPS or fxsPSM)** command to setup voice channels of an Single Channel POTS card (FXS PS) or the POTS card with modem (FXS PSM). The command specifies the list of voice channels, and the setting to apply.

Syntax: **`set {fxsPS-addr|fxsPSM-addr} {setting}`**

Example: **`set 3:1 signal ls`**
To set the port on slot 3 to Loop Start signaling.

{fxsPS-addr|fxsPSM-addr}

Voice channels to apply setting to, in the form of {slot:port}.

slot	Slot number 1-8, location of the FXS PS or FXS PSM card
port	Port number or range

{setting}

rxgain	The receive level range is -12 to +6 (db). Available in .25 dB increments	
signal	Set the DS0 signaling type	
	ls	Set to Loop Start signaling
	lsrb	Set to Loop Start signaling with reverse battery
txgain	Transmit level range is -12 to +6 (db). Available in .25 dB increments	

set id

Use the **set id** command to the unit ID.

Syntax: **`set id {"id-name"}`**

Example: **`set id "Axxius800"`**
Axxius800>

{"id-name"}

The name must be unique with a maximum of 20 characters. Name must be enclosed in quotes.

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set idle

Use the **set idle** command to set the system-wide idle code sent on DS0s.

Syntax: `set idle {pattern}`

Example: `set idle 0xff`

{pattern}

A hexadecimal number with a range from 0x00 to 0xff. This number must be preceeded by 0x.

set ip gateway

Use the **set ip gateway** command to set the IP gateway address (also known as the default route) for the Axxius 800. The command specifies the numeric Internet Protocol (IP) address. The new gateway address will not take effect until Controller is reset (**reset** command).

Syntax: `set ip gateway {ip-addr}`

Example: `set ip gateway 192.168.100.1`

{ip-addr}

Set the IP gateway address for the Axxius 800, using the form xxx.xxx.xxx.xxx, where xxx is a number from 0 to 255.

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set ipds0

Use the **set ipds0** command to setup the DS0 management channel.
Note: the DS0 selected as the DS0 management channel can only reside on the Controller T1.

Syntax: **`set ipds0 {setting} [ds0-addr|ip-addr]`**

Example: **`set ipds0 assign a:1:24`**
The example sets the DS0 management channel to slot A, port 1, channel 24.

{setting}

assign	Assign the DS0 as the IP management channel
delete	Removes the IP over DS0 management channel [default]
down	Set the DS0 management channel down (disables) [default]
ip address	Set the DS0 management channel's IP address and optional subnet mask
navalarm	Set reporting of Access Navigator alarm. If IP over DS0 management is up and a Navigator is not attached, an alarm will be set. This command allows the operator to suppress the alarm in instances when the Axxius is not connected to a Navigator. **Off** - Set reporting of Navigator alarm off. **On** - Set reporting of Navigator alarm on.
up	Set the DS0 management channel up (enables)

[ds0-addr|ip-addr]

The Controller DS0 addresses are different on the DS3 and DS1 Controller.

DS0 Address on a DS3 Controller in the form {slot:port:channel:sub-channel}		
	slot	A for the DS3 Controller card.
	port	Port number, range or all.
	ds1 channel	DS1 channel number, range or all.
	ds0 channel	DS0 channel number, range or all.
DS0 Address on a DS1 Controller in the form {slot:port:channel}		
	slot	A for the DS1 Controller card.
	port	Port number, range or all.
ip-addr	Setup the DS0 management channel IP address and the optional subnet mask, in the form of xxx.xxx.xxx.xxx, where xxx is between 0-255.	

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set key

Use the **set key** command to enable a specific keyed feature. To acquire a feature key code, contact Carrier Access Customer Service. Currently, keyed features (if available) can be enabled on a Controller or a Router.

Syntax: **`set [rtr_card-addr] key {"key-code"}`**

Example: **`set 4 key "q0B8yma2IsSL+1BarY0u"`**

[rtr_card-addr]

The slot number (1-8) that contains the Router card. This optional parameter is used for router specific keyed features. If a slot is not entered, key is directed to the Controller.

{"key-code"}

The key code is entered to enable the specific feature.

set login auth

Use the **set login auth** command to set the authentication method for controller logins, with local database or external RADIUS server. When set to RADIUS the controller will try the configured RADIUS servers first. If none of the configured RADIUS server reply to the request, the controller will use its local database of users to authenticate the login. An attempt set login authentication to RADIUS will fail if there is not at least 1 RADIUS server configured.

Syntax: **`set login auth {local|radius}`**

Example: **`set login auth radius`**
The example will set the login authentication process to RADIUS.

{local|radius}

local	Authenticate user logins via the controller database. Default.
radius	Authenticate user logins via the external RADIUS servers.

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set login support

Use the **set login support** command to enable or disable the internal login accounts for Carrier Access Support personnel for the Controller and Router cards.

Syntax: **`set login support {disable|enable}`**

Example: **`set login support disable`**
The example will prohibit logins via Carrier Access Support passwords.

{disable|enable}

disable	Prohibit logins via Carrier Access Support passwords.
enable	Allow logins via Carrier Access Support passwords.

set lsbackup

Use the **set lsbackup** commands to define the backup protection slot. The service card in this slot must be a hardened Quad T1 service card and can be in any of the 8 Axxius service card slots.

Syntax: **`set lsbackup {t1_card-addr} [remove]`**

Example: **`set lsbackup 8`**

Example: **`set lsbackup 8 remove`**

{t1_card-addr}

The slot number (1-8) that contains a hardened Quad T1 Service card to be used as backup. Note: only one card may be defined as the backup protection card. If this command is applied to a second slot the following message will appear:

```
*-New Backup slot cannot be assigned--old assignment must be
  removed first.
```

To change the backup protection card, a **set lsbackup {slot} remove** command must be applied first.

[remove]

This setting will stop the defined T1 service card as a backup card. Note: the correct slot for the current backup protection card must be used.

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set lsprotect enable/disable

Use the **set lsprotect enable/disable** command to set the global enable or disable the Low Speed Protection options on the system.

Syntax: **`set lsprotect {disable|enable}`**

Example: **`set lsprotect disable`**

{disable|enable}

disable	disable Low Speed Protection on the Axxius system
enable	enable Low Speed Protection on the Axxius system

set lsprotect manual

Use the **set lsprotect manual** command to set manual mode control for protected ports. Note: this command is effective only if lsprotect is enabled (set lsprotect enable).

Syntax: **`set lsprotect {slot:port} manual {disable|enable|release|switchback|switchover} [hold]`**

Example: **`set lsprotect 5:1 manual enable`**

{slot:port}

The {slot:port} address of the protected port to be configured.

slot	Slot number (1-8) where a Quad T1 card is located
port	Port number or range (1-4)

{disable|enable|release|switchback|switchover}

disable	Disables protection for protected port(s)
enable	Enables protection for protected port(s) that have been automatically or manually disabled.
release	Releases manual hold for protected port(s).
switchback	Switches protected port(s) back to home circuit(s).
	[hold] Holds manual switchbacks in-force until user releases hold.
switchover	Manually switches protected ports to backup circuit(s).
	[hold] Holds manual switchbacks in-force until user releases hold.

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set lsprotect nonrevertive

Use the **set lsprotect nonrevertive** command to set low speed protected port(s) to non-revertive mode.

When a port is in non-revertive mode and a failure occurs the port is switched to the protection port, and will remain there until manually reset. However, if the port becomes healthy again and another port has a failure the first port will revert, and the second port will then be protected.

Syntax: **`set lsprotect {slot:port} nonrevertive [priority] [1-7]`**

Example: **`set lsprotect 5:1 nonrevertive priority 2`**

{slot:port}

The {slot:port} address of the protected port to be configured.

slot	Slot number (1-8) where a Quad T1 card is located
port	Port number or range (1-4)

[priority]

An optional parameter, which defines the port priority in the event that multiple protection requests are received for the same port number on different cards.

[1|2|3|4|5|6|7]

A parameter set with low speed priority, which sets the value of the port priority. Range is 1-7, default is 7. Priority 1 is the highest priority, 7 is the lowest priority.

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set lsprotect remove

Use the **set lsprotect remove** command to remove port from protected mode.

Syntax: **`set lsprotect {slot:port} remove`**

Example: **`set lsprotect 5:2 remove`**

```
 Do you really want to do this? y
*-Protected port(s) not removed since they were not previously
assigned.
```

Example: **`set lsprotect 5:2 remove`**

```
> set lsprotect 5:2 remove

 Do you really want to do this? y
OK
```

{slot:port}

The {slot:port} address of the protected port to be configured.

slot	Slot number (1-8) where a Quad T1 card is located
port	Port number or range (1-4)

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set lsprotect revertive

Use the **set lsprotect revertive** command to set low speed protected port(s) to revertive mode.

When a port is set to revertive mode and a failure occurs the port is switched to the protection port. After 5 minutes, with no failures, the port reverts back. If there are 3 reverts in a 24 hour period the port is locked out and will remain with the protection port for 24 hours of no failures, or is manually reset. With 24 hours of no failures one of the 3 reverts is removed from the counter, and if another failure occurs the counter goes back up to 3 and will go into lockout mode again.

Syntax: **`set lsprotect {slot:port} revertive [priority|reset] [1-7]`**

Example: **`set lsprotect 5:2 revertive priority 2`**

Example: **`set lsprotect 6:1 revertive reset`**

```
Slot 6 Port 1 is currently in protective backup.

Resetting the automatic Lockout will cause service interruption
for port(s) currently being backed up. Traffic will be forced
back to the home port(s)
```

{slot:port}

The {slot:port} address of the protected port to be configured.

slot	Slot number (1-8) where a Quad T1 card is located
port	Port number or range (1-4)

[priority|reset]

priority	An optional parameter, which defines the port priority in the event that multiple protection requests are received for the same port number on different cards
reset	If the port is already in a protective mode "reset can be selected. The following message will appear.

[1|2|3|4|5|6|7]

A parameter set with low speed priority, which sets the value of the port priority. Range is 1-7, default is 7. Priority 1 is the highest priority, 7 is the lowest priority.

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set (ocudp) baud

Use the **set (ocudp) baud** command to configure the Baud Rate for OCU-DP ports.

Syntax: **`set {ocudp-addr} baud {rate}[sw56|sw56cp]`**

Example: **`set 3:2 baud 2400`**
Set the baud rate on port 2 to 2400, on the OCU-DP card in slot 3.

{ocudp-addr}

The {slot:port} address of the OCU-DP card you want to apply the changes to.

slot	Slot number (1-8) where the OCU-DP is located
port	Port number or range.

{rate}

2400	Set OCU-DP baud rate to 2400	
4800	Set OCU-DP baud rate to 4800	
9600	Set OCU-DP baud rate to 9600	
19200	Set OCU-DP baud rate to 19200	
38400	Set OCU-DP baud rate to 38400	
56000*	Set OCU-DP baud rate to 56000. This is the default.	
	sw56	Set to switched 56 service
	sw56cp	Set to switched 56 service with call progress capability. Sends special call progress CMI codes to DSU.
64000	Set OCU-DP baud rate to 64000	

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set (ocudp) loopback

Use the **set (ocudp) loopback** command to manually set OCU/CSU loopback tests.

Syntax: **`set {ocudp-addr} loopback {csu|ocu} {loopdown|loopup}`**

Example: **`set 3:2 loopback csu loopdown`**

{ocudp-addr}

The {slot:port} address of the OCU-DP card you want to apply the changes to.

slot	Slot number (1-8) where the OCU-DP is located
port	Port number or range.

{csu|ocu}

csu	Set CSU manual loopback tests
ocu	Set OCU manual loopback tests

{loopdown|loopup}

loopdown*	Stop CSU/OCU manual loopback test. Loopdown is default.
loopup	Start CSU/OCU manual loopback test

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set (ocudp) loopdetect

Use the **set (ocudp) loopdetect** to configure the OCU non-latching/latching loopback code detection.

Syntax: **`set {ocudp-addr} loopdetect {csu|dsu|ocu} {llb|nllb} {disable|enable}`**

Example: **`set 3:2 loopdetect csu llb enable`**

{ocudp-addr}

The {slot:port} address of the OCU-DP card to apply the changes to.

slot	Slot number (1-8) where the OCU-DP is located
port	Port number or range.

{csu|dsu|ocu}

csu	Set CSU manual loop codes detection
dsu	Set DSU manual loop codes detection
ocu	Set OCU manual loop codes detection

{llb|nllb}

llb	Set up latching loopback detection
nllb	Set up non-latching loopback detection

{disable|enable}

disable	Disable loop detection
enable	Enable loop detection

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set (ocudp) mvec

Use the **set (ocudp) mvec** to set Majority Vote Error Correction (MVEC).

Syntax: **`set {ocudp-addr} mvec {disable|enable}`**

Example: **`set 3:2 mvec enable`**

{ocudp-addr}

The {slot:port} address of the OCU-DP card you want to apply the changes to.

slot	Slot number (1-8) where the OCU-DP is located
port	Port number or range.

{disable|enable}

disable*	Disable the error correct. Disable is default.
enable	Enable the error correct

set (ocudp) secondary

Use the **set (ocudp) secondary** to configure the secondary channel service.

Syntax: **`set {ocudp-addr} secondary {disable|enable}`**

Example: **`set 3:2 secondary enable`**

{ocudp-addr}

The {slot:port} address of the OCU-DP card you want to apply the changes to.

slot	Slot number (1-8) where the OCU-DP is located
port	Port number or range.

{disable|enable}

disable*	Disable the secondary channel service. Disable is default.
enable	Enable the secondary channel service

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set (ocudp) selftest

Use the **set (ocudp) selftest** to initiate the OCU-DP card to perform a self test. This request will display a message to wait 8 seconds before requesting selftest status with the status command.

Syntax: `set {ocudp-addr} selftest`

Example: `set 3:2 selftest`

{ocudp-addr}

The {slot:port} address of the OCU-DP card you want to apply the changes to.

slot	Slot number (1-8) where the OCU-DP is located
port	Port number or range.

set (ocudp) up/down

Use the **set (ocudp) up/down** to put the OCU-DP line In or Out-of-Service.

Syntax: `set {ocudp-addr} {down|up}`

Example: `set 3:2 up`
Set the OCU-DP card in slot 3, port 2 as In-Service.

{ocudp-addr}

The {slot:port} address of the OCU-DP card you want to apply the changes to.

slot	Slot number (1-8) where the OCU-DP is located
port	Port number or range.

{up|down}

down	Set OCU-DP port as Out-of-Service
up	Set OCU-DP port as In-Service

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set (router) autologout

Use the **set (router) autologout** command to set the period of time of inactivity after which the user will be automatically logged-out of a Telnet session.

Syntax: **`set {rtr_card-addr} autologout {minutes}`**

Example: **`set 3 autologout 0`**
The example will disable the auto-logout timer in the Router in slot 3.

{rtr_card-addr}

The slot number (1-8) that contains the Router card.

{minutes}

The minutes of inactivity before auto-logout occurs. Range is 0-255. An entry of "0" will disable the auto-logout timer.

set (router) default

Use the **set (router)** default command to reset the TSR card to its default configuration settings. This command will cause the TSR card to perform a reboot.

Syntax: **`set {rtr_card-addr} default`**

Example:
```
set 3 default
Do you really want to do this ?  y
OK
```
The example will reset the Router in slot 3 to its defaults.

{rtr_card-addr}

The slot number (1-8) that contains the Router card.

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set (router) dhcp

Use the **set (router) dhcp** commands to configure the DHCP functions.

set (router) dhcp disable

Use the **set (router) dhcp disable** command to disable both DHCP server and DHCP relay functionality for the specified Router card.

Syntax: **`set {rtr_card-addr} dhcp disable`**

Example: **`set 3 dhcp disable`**
The example will set the Router in slot 3 to disable DHCP.

{rtr_card-addr}

The slot number (1-8) that contains the Router card.

set (router) dhcp relay server

Use the **set (router) dhcp relay server** command to enable a DHCP relay and assign a DHCP server address for the specified Router card.

Syntax: **`set {rtr_card-addr} dhcp relay server {server-number} {ip-addr} {"profile-name"}`**

Example: **`set 3 dhcp relay server 1 134.200.3.45 "remotewan"`**
The example will set the TSR in slot 3 to enable DHCP relay server 1 at IP address 134.200.3.45 on WAN "remotewan".

{rtr_card-addr}

The slot number (1-8) that contains the Router card.

{server-number}

The server number (1 or 2) to specify.

{ip-addr}

The IP address of the server to relay to, in the form of xxx.xxx.xxx.xxx, where xxx is between 0-255.

{"profile-name"}

The profile name for the Router interface that is used to reach this destination. This name must be enclosed in quotes.

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set (router) dhcp server dnsserver

Use the **set (router) dhcp server dnsserver** command to set the IP address of up to 4 DNS servers that the DHCP server will inform the clients of.

Syntax: **`set {rtr_card-addr} dhcp server dnsserver {number} {ip-addr}`**

Example: **`set 5 dhcp server dnsserver 4 122.104.33.220`**
The example will set the 4th DNS server address for the DHCP server on the Router card in slot 5 to 122.104.33.220

{rtr_card-addr}

The slot number (1-8) that contains the Router card.

{number}

The DNS server entry, 1-4.

{ip-addr}

The address of the DNS server, in the form of xxx.xxx.xxx.xxx, where xxx is between 0-255.

set (router) dhcp server domain

Use the **set (router) dhcp server domain** command to select the domain name to provide to DHCP clients.

Syntax: **`set {rtr_card-addr} dhcp server domain {"domain-name"}`**

Example: **`set 5 dhcp server domain "carrieraccess.com"`**
The example sets the domain name to "carrieraccess.com" in the DHCP server on the TSR in slot 5.

{rtr_card-addr}

The slot number (1-8) that contains the Router card.

{"domain-name"}

The domain name, with a maximum of 43 characters. Name must be enclosed in quotes.

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set (router) dhcp server duration

Use the **set (router) dhcp server duration** command to set the lease duration that the DHCP server applies to client assignments.

Syntax: **`set {rtr_card-addr} dhcp server duration {hours:minutes}`**

Example: **`set 5 dhcp server duration 3:45`**
The example set the lease duration for the DHCP server on the Router in slot 5 to 3 hours and 45 minutes.

{rtr_card-addr}

The slot number (1-8) that contains the Router card.

{hours:minutes}

The lease duration in hours and minutes, in the form of HH:MM.
HH = 1-999, MM = 1-60.

set (router) dhcp server netbios nameserver

Use the **set (router) dhcp server netbios nameserver** command to set the NetBIOS Name Server (NBNS - RFC 1001/1002) that the DHCP server provides to clients.

Syntax: **`set {rtr_card-addr} dhcp server netbios nameserver {1|2} {ip-addr}`**

Example: **`set 5 dhcp server netbios nameserver 1 192.168.100.80`**
Note: DHCP server must first be enabled with the "startaddr" command. See *set (router) dhcp server startaddr on page 5-107*.

{rtr_card-addr}

The slot number (1-8) that contains the Router card.

{1|2}

The NetBIOS Name Server entry.

{ip-addr}

The NBNS IP address, in the form of xxx.xxx.xxx.xxx, where xxx is between 0-255.

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set (router) dhcp server netbios nodetype

Use the **set (router) dhcp server netbios nodetype** command to set the NetBIOS node type (see RFC 1001/1002) that the DHCP server provides to clients.

Syntax: **`set {rtr_card-addr} dhcp server netbios nodetype {type-number}`**

Example: **`set 5 dhcp server netbios nodetype 1`**
The example will set the NetBIOS node type to B-node.

Note: DHCP server must first be enabled with the "startaddr" command. See *set (router) dhcp server startaddr on page 5-107*.

{rtr_card-addr}

The slot number (1-8) that contains the Router card.

{type-number}

The value is specified as a single octet that identifies the client type.

1	B-node	**4**	M-node
2	P-node	**8**	H-node

set (router) dhcp server netbios scope

Use the **set (router) dhcp server netbios scope** command to set the NetBIOS scope value (see RFC 1001/1002) that the DHCP server provides to clients.

Syntax: **`set {rtr_card-addr} dhcp server netbios scope {scope-name}`**

Example: **`set 5 dhcp server netbios scope "Accounting"`**
Note: DHCP server must first be enabled with the "startaddr" command. See *set (router) dhcp server startaddr on page 5-107*.

{rtr_card-addr}

The slot number (1-8) that contains the Router card.

{scope-name}

The Scope is a DHCP option that represents a grouping of computers on a subnet using the same NetBIOS name. Enter up to 41 alphanumeric characters for the scope-name, enclosed in quotes.

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set (router) dhcp server startaddr

Use the **set (router) dhcp server startaddr** command to enable the DHCP server on the specified Router card.

Syntax: **`set {rtr_card-addr} dhcp server startaddr {ip-addr} {count}`**

Example: **`set 4 dhcp server startaddr 134.200.3.1 254`**
The example will set the TSR in slot 4 to enable the DHCP server with 254 address pool starting at 134.200.3.1.

{rtr_card-addr}

The slot number (1-8) that contains the Router card.

{ip-addr}

The starting address of the client address pool, in the form of xxx.xxx.xxx.xxx, where xxx is between 0-255.

{count}

The number of IP addresses in the client address pool (1-254).

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set (router) dns

Use the **set (router) dns** commands to set Domain Name Server (DNS) options.

set (router) dns domain

Use the **set (router) dns domain** command to set the default domain that the DNS resolver will add to any name queries that are not fully qualified.

Syntax: **`set {rtr_card-addr} dns domain {domain-name"}`**

Example: **`set 3 dns domain "mycompany.com"`**
The example will set the default domain to "mycompany.com" for the Router in slot 3.

{rtr_card-addr}

The slot number (1-8) that contains the Router card.

{"domain-name"}

The domain name, with a maximum of 43 characters. Name must be enclosed in quotes.

set (router) dns name

Use the **set (router) dns name** command to set the TSR card host name.

Syntax: **`set {rtr_card-addr} dns name {"host-name"}`**

Example: **`set 3 dns name "Axxius25"`**
The example will set the Router card host name to "Axxius25" for the Router in slot 3.

{rtr_card-addr}

The slot number (1-8) that contains the Router card.

{"host-name"}

The host name for the Router card. This name must be enclosed in quotes, with a maximum of 15 characters.

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set (router) dns resolver

Use the **set (router) dns resolver** command to enable/disable use of DNS resolver to convert domain names to IP addresses. The DNS server address must be set before the DNS resolver can be enabled.

Syntax: **`set {rtr_card-addr} dns resolver {disable|enable}`**

Example: **`set 3 dns resolver disable`**
The example will disable the DNS resolver for the Router in slot 3.

{rtr_card-addr}

The slot number (1-8) that contains the Router card.

{disable|enable}

disable	Disable DNS resolver
enable	Enable DNS resolver

set (router) dns server

Use the **set (router) dns server** command to configure the IP address of DNS servers.

Syntax: **`set {rtr_card-addr} dns server {1|2} {ip-addr}`**

Example: **`set 3 dns server 1 10.10.10.0`**
The example will set the IP address of the DNS server number 1 to 10.10.10.0 for the Router in slot 3.

{rtr_card-addr}

The slot number (1-8) that contains the Router card.

{1|2}

1	Setup IP address of DNS server 1
2	Setup IP address of DNS server 2

{ip-addr}

The IP address, in the form of xxx.xxx.xxx.xxx, where xxx is between 0-255.

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set (router) enhanced security

Use the **set (router) enhanced security** command to enable or disable enhanced login security on the TSR. When enabled the user will not receive any login prompt or other output until the security password is typed. The security password is set via the *set (router) password* command.

Syntax: `set {rtr_card-addr} enhanced security {disable|enable}`

Example: `set 5 enhanced security enable`
The example will enable the enhanced security on the Router card in slot 5.

Note: A **set 5 password security "password"** command must be completed before the enhanced security can be enabled.
See, *set (router) password on page 5-114*

{rtr_card-addr}

The slot number (1-8) that contains the Router card.

{disable|enable}

disable	Disable enhanced login security
enable	Enable enhanced login security

set (router) lmi

Use the **set (router) lmi** command to specify the Local Management Interface (LMI) protocol to use for the specified Router card.

Syntax: `set {rtr_card-addr} lmi {annexd|disable|lmi}`

Example: `set 5 lmi annexd`
The example will configure LMI on the Router card in slot 5 to Annex D.

{rtr_card-addr}

The slot number (1-8) that contains the Router card.

{annexd|disable|lmi}

annexd	Set LMI to Annex D.
disable	Disable LMI on the TSR.
lmi	Set LMI to LMI rev1 (DLCI 1023)

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set (router) lmi poll

Use the **set (router) lmi poll** command to specify the Local Management Interface (LMI) for the specified Router card.

Syntax: **`set {rtr_card-addr} lmi poll {counter|interval} {value}`**

Example: **`set 5 lmi poll counter 15`**
The example will configure LMI poll count to 15, on the Router card in slot 5.

{rtr_card-addr}

The slot number (1-8) that contains the Router card.

{counter|interval}

counter	Set the LMI count. **{value}** = count of how many link status enquiries can go un-responded before the link is declared down. Range is 0-255.
interval	Set LMI period **{value}** = LMI period. Range is between 0-255 seconds.

set (router) login auth

Use the **set (router) login auth** command to specify how login authentication for this router should be performed. The router supports a configuration setting for each router card to determine how the router card logins are to be authenticated, as per one of the following choices: authenticate router logins from the router card local database (default), or authenticate router logins identically to Controller logins. The last choice will cause the router logins to be authenticated via the Controller's database of users and passwords, as configured for the Controller.

Syntax: **`set {rtr_card-addr} login auth {controller|local|radius}`**

Example: **`set 1 login auth controller`**
The example will set the TSR card in slot 1 to use the same login setting as the Controller.

{rtr_card-addr}

The slot number (1-8) that contains the Router card.

{controller|local|radius}

controller	Use the Controller's login auth setting
local	Authenticate logins locally
radius	Authenticate logins with RADIUS server

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set (router) login prompt

Use the **set (router) login prompt** command to enable/disable the login prompt on the specified Router card.

Syntax: **`set {rtr_card-addr} login prompt {disable|enable}`**

Example: **`set 1 login prompt enable`**
The example will set the Router card to require a login with Telnets from the Controller.

{rtr_card-addr}

The slot number (1-8) that contains the Router card.

{controller|local|radius}

disable	Disable the login prompt
enable	Enable the login prompt

set (router) ntp

Use the **set (router) ntp** command to setup Network Time Protocol (NTP) parameters.
Note: not operational in this release.

set (router) ntp enable/disable

Use the **set (router) ntp enable/disable** command to enable/disable NTP processing.

Syntax: **`set {rtr_card-addr} ntp {disable|enable}`**

Example: **`set 1 ntp enable`**
The example will enable NTP processing on the Router card in slot 1.

{rtr_card-addr}

The slot number (1-8) that contains the Router card.

{disable|enable}

disable	Disable NTP processing
enable	Enable NTP processing

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set (router) ntp poll

Use the **set (router) ntp poll** command to specify polling of the NTP server every defined number of seconds. **Note: not operational in this release.**

Syntax: **`set {rtr_card-addr} ntp poll {seconds}`**

Example: **`set 1 ntp poll 120`**
The example will Poll the Network Time Protocol server every 2 minutes, for the Router card in slot 1.

{rtr_card-addr}

The slot number (1-8) that contains the Router card.

{seconds}

The number of seconds between polls. Seconds range is 16 to 1024. Default is 16.

set (router) ntp server

Use the **set (router) ntp server** command to specify the IP address of the NTP server. **Note: not operational in this release.**

Syntax: **`set {rtr_card-addr} ntp server {ip-addr}`**

Example: **`set 1 ntp server 10.10.10.0`**
The example will set the address to be used to access the NTP server to 10.10.10.0, on the Router in slot 1.

{rtr_card-addr}

The slot number (1-8) that contains the Router card.

{ip-addr}

The IP address of the NTP server, in the form of xxx.xxx.xxx.xxx, where xxx is between 0-255. Setting the NTP server value to 0.0.0.0 will cause the Router to listen to and process NTP broadcasts.

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set (router) ntp timezone

Use the **set (router) ntp timezone** command to specify the timezone offset relative to GMT for this TSR. **Note: not operational in this release.**

Syntax: **`set {rtr_card-addr} ntp timezone {hour-offset} [minute-offset]`**

Example: **`set 1 ntp timezone -5`**
The example will specify the gateway time to be 5 hours from GMT (Greenwich Mean Time), which equates to Eastern Standard time, for the Router in slot 1.

{rtr_card-addr}

The slot number (1-8) that contains the Router card.

{hour-offset}

Used to calculate gateway time from GMT. The hour-offset range is -12 to 12.

[minute-offset]

Used to calculate gateway time from GMT. The minute-offset range is 0 to 60.

set (router) password

Use the **set (router) password** command to manage password access on the specified Router card.

Syntax: **`set {rtr_card-addr} password {setting} {"password"}`**

Example: **`set 5 password view "Fred"`**
The example will set the password to the view level to "Fred" on the Router card in slot 5.

{rtr_card-addr}

The slot number (1-8) that contains the Router card.

{setting}

admin	Set Administration level password on the Router.
config	Set Configuration level password on the Router.
security	Set Security level password on the Router.
view	Set View level password on the Router.

{"password"}

A password with a maximum of 15 characters. Password must be enclosed in quotes, and is case-sensitive.

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set (router) port

Use the **set (router) port** command to set port characteristics on a Terminal Server Router (TSR) card.

set (router) port baudrate

Use the **set (router) port baudrate** command to set the baud rate on a TSR port.

Syntax: **`set {tsr_card-addr} port {port-number} baudrate {value}`**

Example: **`set 5 port 2 baudrate 38400`**
The example will set the baud rate to 38400 on the second port on the TSR card in slot 5.

{tsr_card-addr}

The slot number (1-8) that contains the TSR card.

{port-number}

The port number (1-4) of the TSR card.

{value}

The values listed below are the baud rates that have been tested and are selectable with the auto-completion feature. A rate that is not listed may be manually typed in the {value} field, range is 11 to 691200. Not all baud rates will resolve exactly, in this circumstance the closest possible rate will be chosen and the user informed of the rate.

1200	Set baud rate to 1200
2400	Set baud rate to 2400
4800	Set baud rate to 4800
9600	Set baud rate to 9600
19200	Set baud rate to 19200
38400	Set baud rate to 38400
57600	Set baud rate to 57600
115200	Set baud rate to 115200

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set (router) port databits

Use the **set (router) port databits** command to set the data bits on a TSR port.

Syntax: **`set {tsr_card-addr} port {port-number} databits {5|6|7|8}`**

Example: **`set 5 port 2 databits 6`**
The example will set the data bits to 6 on the port 2 on the TSR card in slot 5.

{tsr_card-addr}

The slot number (1-8) that contains the TSR card.

{port-number}

The port number (1-4) of the TSR card.

{5|6|7|8}

Allowable data bits. **Note: If 1.5 Stop Bits is selected, the Data Bits setting MUST be 5 Data Bits, if 2 Stop Bits is selected, 5 Data Bits MUST NOT be selected. See *set (router) port stopbits on page 5-122.***

set (router) port dsr low reset

Use the **set (router) port dsr low reset** command to cause a RE-232 session to terminate when DSR (Data Set Ready) goes low. This setting can be issued when the card is physically strapped for Ethernet, but has not effect. This setting also only goes into effect when the DSR signal is high. This setting can be done for any application type but is only active for **termserv** and **rawtcp** modes.

Syntax: **`set {tsr_card-addr} port {port-number} dsr low reset {disable|enable}`**

Example: **`set 5 port 2 dsr low reset enable`**

{tsr_card-addr}

The slot number (1-8) that contains the TSR card.

{port-number}

The port number (1-4) of the TSR card.

{disable|enable}

disable	Disable will not use the reset feature. Default
enable	Enable causes the session to teardown when DSR goes low.

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set (router) port flowcontrol

Use the **set (router) port flowcontrol** command to set the flow control on a TSR port. This command controls the transfer of messages or characters between two points in a data network to prevent congestion, or loss of data when the receiving device's buffer begins to reach its capacity.

Syntax: **`set {tsr_card-addr} port {port-number} flowcontrol {none|rtscts|xonxoff}`**

Example: **`set 5 port 2 flowcontrol none`**
The example will set the flowcontrol to none on the second port on the TSR card in slot 5.

{tsr_card-addr}

The slot number (1-8) that contains the TSR card.

{port-number}

The port number (1-4) of the TSR card.

{none|rtscts|xonxoff}

none	Set flow control to none
rtscts	Set flow control to hardware
xonxoff	Set flow control to xonxoff

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set (router) port inactivity timer

Use the **set (router) port inactivity timer** command to set the inactivity timeout for a RS-232 session. This setting can be issued when the card is physically strapped for Ethernet, bus has no effect. When this timer is set, the socket will be reset when no data is sent or received on the port for the number of minutes the timer is set to. This timer can be set for any application type, but is only active for **termserv** and **rawtcp** modes.

Syntax: **`set {tsr_card-addr} port {port-number} inactivity timer {disable|time}`**

Example: **`set 5 port 2 inactivity timer 30`**

{tsr_card-addr}

The slot number (1-8) that contains the TSR card.

{port-number}

The port number (1-4) of the TSR card.

{disable|time}

disable	Disable will not use a inactivity timer. Default.
time	The inactivity timer will cause the session to timeout and teardown when a value is entered. Range is 1 - 999.

set (router) port ip

Use the **set (router) port ip** command to set an IP address for a TSR port.

Syntax: **`set {tsr_card-addr} port {port-number} ip {ip-addr}`**

Example: **`set 5 port 2 ip 192.100.1.1`**
The example will set the IP address on the second port on the TSR card in slot 5 to 192.100.1.1.

{tsr_card-addr}

The slot number (1-8) that contains the TSR card.

{port-number}

The port number (1-4) of the TSR card.

{ip-addr}

The IP address for the defined port, in the form of xxx.xxx.xxx.xxx, where xxx is between 0-255.

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set (router) port name

Use the **set (router) port name** command to set define name for a TSR port.

Syntax: **`set {tsr_card-addr} port {port-number} name {"name"}`**

Example: **`set 5 port 2 name "portname"`**
The example will set a port name on the second port on the TSR card in slot 5 to "portname".

{tsr_card-addr}

The slot number (1-8) that contains the TSR card.

{port-number}

The port number (1-4) of the TSR card.

{name}

Port identifier, with up to 15 characters, enclosed in quotes.

set (router) port parity

Use the **set (router) port parity** command to set the parity on a TSR port.

Syntax: **`set {tsr_card-addr} port {port-number} parity {even|none|odd}`**

Example: **`set 5 port 2 parity none`**
The example will set the parity on the second port on the TSR card in slot 5 to none.

{tsr_card-addr}

The slot number (1-8) that contains the TSR card.

{port-number}

The port number (1-4) of the TSR card.

{even|none|odd}

even	Set even parity to the TSR port
none	Set no parity to the TSR port
odd	Set odd parity to the TSR port

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set (router) port passive

Use the **set (router) port passive** command to set the TSR port to passive. This command will terminate any active telnet connection on this interface and will reinitialize its associated TCP socket.

Syntax: `set {tsr_card-addr} port {port-number} passive`

Example: `set 1 port 2 passive`

Do you wish to do this (y/n)?

{tsr_card-addr}

The slot number (1-8) that contains the TSR card.

{port-number}

The port number (1-4) of the TSR card.

set (router) port password

Use the **set (router) port password** command to set the password on a TSR port.

Syntax: `set {tsr_card-addr} port {port-number} password {"password"}`

Example: `set 1 port 2 password "test"`

This command will set the password for port 2 on the TSR card in slot 1 to "test".

{tsr_card-addr}

The slot number (1-8) that contains the TSR card.

{port-number}

The port number (1-4) of the TSR card.

{"password"}

A password with a maximum of 15 characters, enclosed in quotes.

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set (router) port prompt

Use the **set (router) port prompt** command to set the authentication prompt on a TSR port.

Syntax: **`set {tsr_card-addr} port {port-number} prompt {disable|enable}`**

Example: **`set 1 port 2 prompt enable`**
This command will enable the authentication prompt for port 2 on the TSR card in slot 1.

{tsr_card-addr}

The slot number (1-8) that contains the TSR card.

{port-number}

The port number (1-4) of the TSR card.

{disable|enable}

disable	Disable the Authentication Prompt on a TSR port
enable	Set the Authentication Prompt on a TSR port

set (router) port protocolport

Use the **set (router) port protocolport** command to set the protocol port on a TSR port.

Syntax: **`set {tsr_card-addr} port {port-number} protocolport {protocol-port}`**

Example: **`set 1 port 2 protocolport 1024`**
This command will set the protocol port to 1024 for port 2 on the TSR card in slot 1.

{tsr_card-addr}

The slot number (1-8) that contains the TSR card.

{port-number}

The port number (1-4) of the TSR card.

{protocol-port}

The protocol port range is 1 - 65525. 0 is the wildcard, any port designator.

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set (router) port stopbits

Use the **set (router) port stopbits** command to set the number of stop bits on a TSR port. The stop bit is an interval at the end of each Asynchronous Character that allows the receiving computer to pause before the start of the next character.

Syntax: **`set {tsr_card-addr} port {port-number} stopbits {1|1.5|2}`**

Example: **`set 5 port 2 stopbits 1`**
The example will set the number of stop bits on the second port on the TSR card in slot 5 to 1.

{tsr_card-addr} - The slot number (1-8) that contains the TSR card.

{port-number} - The port number (1-4) of the TSR card.

{1|1.5|2}
Stop bits values available. **Note: If 1.5 Stop Bits is selected, the Data Bits setting MUST be 5 Data Bits, if 2 Stop Bits is selected, 5 Data Bits MUST NOT be selected.**

set (router) port tbos map description

Use the **set (router) port tbos map description** command to set a description attribute for one of the eight available TBOS displays. This setting can be issued when the card is physically strapped for Ethernet, but has no effect. This setting can be done for any application type but is only used when type is set to TBOS.
Note: this command is only available on a TSR card that has TBOS feature enabled.

Syntax: **`set {tsr_card-addr} port {port-number} tbos map {map-addr} description {"text-string"}`**

Example: **`set 5 port 2 tbos map 4 description "Site 7, St. Louis, MO"`**

{tsr_card-addr} - The slot number (1-8) that contains the TSR card.

{port-number} - The port number (1-4) of the TSR card.

{map-addr}
One of the eight TBOS displays available for monitoring equipment. Range is 1 - 8.

{"text-string"}
The TBOS map description command assigns a text string (0 - 19 characters) to a designated display number. Default is an empty string ("").

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set (router) port tbos map display

Use the **set (router) port tbos map display** command to set a TBOS (Telemetry Byte Oriented Serial) display map value for one of the eight TBOS display available for monitoring equipment. This setting can be issued when the card is physically strapped for Ethernet, but has no effect. This setting can be done for any application type but is only used when type is set to TBOS.
Note: this command is only available on a TSR card that has TBOS feature enabled.

Syntax: **`set {tsr_card-addr} port {port-number} tbos map {map-addr} display {device|none}`**

Example: **`set 5 port 2 tbos map 4 display lynx_ds3`**

{tsr_card-addr} - The slot number (1-8) that contains the TSR card.

{port-number} - The port number (1-4) of the TSR card.

{map-addr}

One of the eight TBOS displays available for monitoring equipment. Range is 1 - 8.

{device|none}

device-type	**alcatel_mdr_4000**	Alcatel MDR-4000 radio for monitoring
	lynx_1_4_port_prot_sw	Proxium Lynx radio
	lynx_8_port_prot_sw	Proxium Lynx radio
	lynx_ds3	Proxium Lynx radio
	lynx_hd_31145_10	Proxium Lynx radio
	lynx_hd_31145_1f	Proxium Lynx radio
none	None will disable monitoring for that TBOS display.	

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set (router) port type

Use the **set (router) port type** command to set the application being used for a RS-232 (serial) port. This setting can be issued when the card is physically strapped for Ethernet, but has no effect. This command applies to the TSR only.

Syntax: **`set {tsr_card-addr} port {port-number} type {termserv|rawtcp|tbos}`**

Example: **`set 5 port 2 type tbos`**

{tsr_card-addr} - The slot number (1-8) that contains the TSR card.

{port-number} - The port number (1-4) of the TSR card.

{termserv|rawtcp|tbos}

termserv	Terminal server. Default.
rawtcp	Raw TCP.
tbos	TBOS (Telemetry Byte Oriented Serial). Note: this setting requires TBOS feature to be enabled on the TSR service card. Contact Customer Service for information on purchasing this software keyed feature.

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set (router) ppp auth

Use the **set (router) ppp auth** command to configure the PPP (Point-to-Point Protocol) authentication on the specified Router card.

set (router) ppp auth byremote protocol

Syntax: `set {rtr_card-addr} ppp auth byremote protocol {chap|none|pap}`

Example: `set 5 ppp auth byremote protocol none`
The example will set the Router in slot 5 to not allow PPP authentication of this Axxius by the remote PPP device.

{rtr_card-addr}

The slot number (1-8) that contains the Router card.

{chap|none|pap}

chap	Set to the CHAP protocol.
none	The remote PPP device cannot authenticate this Axxius (default).
pap	Set to the PAP protocol.

set (router) ppp auth byremote secret

Syntax: `set {tsr_card-addr} ppp auth byremote secret {"password"}`

Example: `set 5 ppp auth byremote secret "public"`
The example will set the PPP authentication secret/password for the TSR in slot 5 to "public"

Note: A **set (router) ppp auth by remote protocol** command must be completed before this command can be implemented.

{tsr_card-addr}

The slot number (1-8) that contains the TSR card.

{"password"}

A password with a maximum of 15 characters, enclosed in quotes.

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set (router) ppp auth byremote user

Syntax: `set {rtr_card-addr} ppp auth byremote user {profilename|"protocol-name"}`

Example: `set 5 ppp auth byremote user profilename`
The example will set the PPP authentication user name for the Router in slot 5 to equal the profile name.

Note: A **set (router) ppp auth byremote protocol** command must be completed before this command can be implemented.

{rtr_card-addr}

The slot number (1-8) that contains the Router card.

{profilename|"protocol-name"}

profilename	Use the profile name as the CHAP or PAP user name.
"protocol-name"	The CHAP or PAP user name. A maximum of 16 characters, enclosed in quotes.

set (router) ppp auth ofremote protocol

Syntax: `set {rtr_card-addr} ppp auth ofremote protocol {chap|none|pap}`

Example: `set 5 ppp auth ofremote protocol none`
The example will set the Router in slot 5 to not allow PPP authentication of this Axxius by the Router.

{rtr_card-addr}

The slot number (1-8) that contains the Router card.

{chap|none|pap}

chap	Set to the CHAP protocol.
none	The remote PPP device cannot authenticate this Axxius (default).
pap	Set to the PAP protocol.

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set (router) ppp security

Use the **set (router) ppp security** command to set up the local external security server, that the Router will use to authenticate remote PPP devices.

set (router) ppp security address

Syntax: `set {rtr_card-addr} ppp security address {ip-addr}`

Example: `set 5 ppp security address 10.1.1.1`

The example will set external security server address to 10.1.1.1, for the Router in slot 5.

Note: A **set (router) ppp security server** command must be completed before this command can be implemented.

{rtr_card-addr}

The slot number (1-8) that contains the Router card.

{ip-addr}

The IP address, in the form of xxx.xxx.xxx.xxx, where xxx is between 0-255.

set (router) ppp security password

Syntax: `set {rtr_card-addr} ppp security password {"password"}`

Example: `set 5 ppp security password "public"`

The example will set the password to a local external security server to "public", for the Router in slot 5.

Note: A **set (router) ppp auth by remote protocol** command must be completed before this command can be set.

{rtr_card-addr}

The slot number (1-8) that contains the Router card.

{"password"}

A password with a maximum of 15 characters. Password must be enclosed in quotes.

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set (router) ppp security server

Syntax: **`set {rtr_card-addr} ppp security server {none|radius|tacacs}`**

Example: **`set 5 ppp security server none`**
The example will set the Router in slot 5 to not use an external security server to authenticate remote PPP devices.

{rtr_card-addr}

The slot number (1-8) that contains the Router card.

{none|radius|tacacs}

none	Do not use an external security server to authenticate remote PPP devices (default).
radius	Will set the server to use the RADIUS (Remote Authentication Dial-In Service) protocol. RADIUS is a client/server-based authentication software system.
tacacs	Will set the server to use the TACACS+ (Terminal Access Controller Access Control System) protocol. TACACS+ provides services of authentication, authorization and accounting independently.

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set (router) proxy

Use the **set (router) proxy** command to enable/disable proxy ARP mode on the Router. This command will add an IP interface between the Controller and the Router over the backplane. In this way the Controller can be accessed by IP hosts over the Router's LAN/WAN interfaces without using the Controller's physical Ethernet interface.

Syntax: **`set {rtr_card-addr} proxy {disable|enable} [ip-addr] [mask|bits]`**

Example:
```
set ethernet ip address 10.0.0.1 255.0.0.0
set 3:1 ip address 192.168.100.1/24
set 3 proxy enable 192.168.100.80/24
set ip gateway 192.168.100.80
```
Set a Router card port to proxy ARP for the Adit 600, where the Router card is located in slot 3. In this example the Controller is reachable at 192.168.100.80 and Router at 192.168.100.1.

Example:
```
set ethernet ip address 10.0.0.1 255.0.0.0
set 3:1 ip address 192.168.100.1/24
set 3 proxy enable 192.168.100.80/24
set ip gateway 192.168.100.1
```
Set a Router card port to proxy ARP for the Adit 600, where the Router card is located in slot 3. In this example the Controller and Router will share address 192.168.100.1 on the Router. Telnet and SNMP connections to 192.168.100.1 will connect to the Controller.

{rtr_card-addr}

The slot number (1-8) that contains the Router (TSR) card.

{disable|enable}

When proxy ARP is enabled the Router will allow both the Router and Controller to be accessed from the Router LAN and WAN interfaces.

{ip-addr}

Set the IP address for the proxy interface on the Adit 600, using the form xxx.xxx.xxx.xxx, where xxx is a number from 0 to 255.

[mask|bits]

mask	Set the subnet mask, using the form xxx.xxx.xxx.xxx, where xxx is a number from 0 to 255. This is an optional setting.
bits	Use this field to identify the number of bits, from left to right that will be used to match the IP Address field within the data packet. Range is between 1-32.

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There are numerous cases of IP address assignments for the proxy and each case causes slightly different behavior:

Proxy address is in the same subnet as the Controller LAN address. If the Controller Ethernet IP address and the proxy IP address are in the same subnet, either since both addresses are the same or they fall into the same subnet based on address and mask, the Controller will attempt to use the Ethernet interface to send packets to other hosts in that subnet. Once an external host has sent a packet to the Controller that arrives on the proxy interface, the Controller will then use the proxy interface for all communication to that host.

Proxy address is in a different subnet than the Controller LAN address. If the Controller Ethernet IP address and the proxy IP address are in different subnets based on address and mask, then the Controller will use either the Ethernet interface or proxy interface to send packets to other hosts, based on which subnet the host is in or, which subnet the IP gateway is on.

Proxy address is equal to one of the Router's numbered IP addresses. If the Controller proxy IP address is equal to one of the Router's own numbered IP addresses or equal to one of the Router's static NAT addresses that maps to one of the Router's numbered IP addresses, then the Controller and Router will appear to be a single IP host to devices on any of the Router's interfaces.

This is a very useful mode that will make the Controller and Router appear to be a single IP device. When working in this mode, all management traffic directed to the Router will be forwarded internally to the Controller instead. This includes Telnet, SNMP, Adit-Navigator socket applications. When configured this way, an external host Telnet to the Router will go to the Controller login prompt and CLI.

If the proxy interface is to be the primary IP interface between the Controller and other hosts, then it is highly recommended that the IP gateway be set to the same address as the proxy address. This will make the proxy interface the default route for IP datagrams.

It is highly recommended for optimum connectability, that the Controller's proxy IP address be a unique host address in one of the Router subnets or be equal to one of the Router IP addresses if the user wishes to have both devices share a single IP address, and that the IP gateway address be set to equal the proxy address.

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set (router) reboot

Use the **set (router) reboot** command to set automatic reboot after an upload of code or configuration file.

Syntax: **`set {rtr_card-addr} reboot {code|config} {disable|enable}`**

Example: **`set 5 reboot both disable`**
Disable automatic reboot after upload for the Router in slot 5.

{rtr_card-addr}

The slot number (1-8) that contains the Router card.

{code|config}

code	Automatic reboot after code upload
config	Automatic reboot after configuration upload

{disable|enable}

disable	Will disable automatic reboot
enable	Will enable the automatic reboot after upload of a file

set (router) rip

Use the **set (router) rip** command to specify RIP packets to transmit and receive.

Syntax: **`set {rtr_card-addr} rip {recv|send} {v1|v2|v1and2}`**

Example: **`set 3 rip recv v1`**
The example will configure receive RIP on the Router card in slot 3 to V1.

{rtr_card-addr}

The slot number (1-8) that contains the Router card.

{recv|send}

recv	Set RIP receive version
send	Set RIP send version

{v1|v2|v1and2}

v1	Set RIP to version 1
v2	Set RIP to version 2
v1and2	Set RIP to version 1 and version 2

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set (router) snmp

Use the **set (router) snmp** command to set the SNMP contact, location and name on the specified Router card.

set (router) snmp contact

Use the **set (router) snmp contact** command to set the value of sysContact on the specified Router card.

Syntax: **`set {rtr_card-addr} snmp contact {"contact-name"}`**

Example: **`set 1 snmp contact "John Doe"`**
The example will set the value of sysContact on the Router card in slot 1 to "John Doe".

{rtr_card-addr}

The slot number (1-8) that contains the Router card.

{"contact-name"}

The value of sysContact, with a maximum of 64 ASCII characters. Name must be enclosed in quotes.

set (router) snmp location

Use the **set (router) snmp location** command to set the value of sysLocation on the specified Router card.

Syntax: **`set {rtr_card-addr} snmp location {"location-name"}`**

Example: **`set 1 snmp location "Newark"`**
The example will set the value of sysLocation on the Router card in slot 1 to "Newark".

{rtr_card-addr}

The slot number (1-8) that contains the Router card.

{"location-name"}

The value of sysLocation, with a maximum of 64 ASCII characters. Name must be enclosed in quotes.

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set (router) snmp name

Use the **set (router) snmp name** command to set the value of sysName on the specified Router card.

Syntax: **`set {rtr_card-addr} snmp name {"system-name"}`**

Example: **`set 1 snmp name "AxxiusRouters"`**
The example will set the value of sysName on the TSR card in slot 1 to "AxxiusRouters".

{rtr_card-addr}

The slot number (1-8) that contains the Router card.

{"system-name"}

The value of sysName, with a maximum of 64 ASCII characters. Name must be enclosed in quotes.

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set (router) stp

Use the **set (router) stp** commands to configure the Spanning Tree Protocol on the Router. **Note**: Enter {slot} only, if {slot:port} is entered the command will be directed to the Router LAN and not the Router Card.

set (router) stp bridge forwarddelay

Use the **set (router) stp bridge forwarddelay** command to configure Spanning Tree bridge forward delay value for the bridge. The bridge forward delay is the time spent by a Port in the Listening or Learning States before the transitioning to the Learning or Forwarding State, respectively.

Syntax: **`set {rtr_card-addr} stp bridge forwarddelay {value}`**

Example: **`set 3 stp bridge forwarddelay 15`**
The example will set the Spanning Tree bridge forward delay time to 15 seconds, on the Router in slot 3.

{rtr_card-addr}

The slot number (1-8) that contains the Router card.

{value}

The value can range from 4 to 30 seconds, with a default of 15.

set (router) stp bridge hellotime

Use the **set (router) stp bridge hellotime** command to configure Spanning Tree bridge hello time value for the bridge.

Syntax: **`set {rtr_card-addr} stp hellotime {value}`**

Example: **`set 3 stp bridge hellotime 3`**
The example will set the Spanning Tree bridge hello time to 3 seconds, on the Router in slot 3.

{rtr_card-addr}

The slot number (1-8) that contains the Router card.

{value}

The value can range from 1 to 10 seconds, with a default of 2.

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set (router) stp bridge maxage

Use the **set (router) stp bridge maxage** command to configure Spanning Tree maximum age value for the bridge. The bridge max age value specifies the maximum age of received protocol information before it is discarded.

Syntax: **`set {rtr_card-addr} stp maxage {value}`**

Example: **`set 3 stp bridge maxage 15`**
The example will set the Spanning Tree bridge max age to 15 seconds, on the Router in slot 3.

{rtr_card-addr}

The slot number (1-8) that contains the Router card.

{value}

The value can range from 6 to 40 seconds, with a default of 20.

set (router) stp bridge priority

Use the **set (router) stp bridge priority** command to configure Spanning Tree priority value for the bridge.

Syntax: **`set {rtr_card-addr} stp priority {value}`**

Example: **`set 3 stp bridge priority 32768`**
The example will set the Spanning Tree bridge priority to 32768, on the Router in slot 3.

{rtr_card-addr}

The slot number (1-8) that contains the Router card.

{value}

The value can range from 0 to 65535, with a default of 32768.

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set (router) stp enable/disable

Use the **set (router) stp enable/disable** command to enable and disable Spanning Tree Protocol on the Router.

Syntax: **`set {rtr_card-addr} stp {disable|enable}`**

Example: **`set 3 stp enable`**
The example will enable Spanning Tree on the Router in slot 3.

{rtr_card-addr}

The slot number (1-8) that contains the Router card.

Note: Enter {slot} only. If {slot:port} is entered the command will be directed to the Router LAN and not the Router Card.

{disable|enable}

disable	Disable Spanning Tree protocol
enable	Enable Spanning Tree protocol

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set (router) syslog

Use the **set (router) syslog** commands to configure the Router to send alarm and event messages to a Syslog server.

set (router) syslog enable/disable

Use the **set (router) syslog enable/disable** command to enable and disable sending alarm and event messages to an external Syslog server from the Router.

Syntax: **`set {rtr-addr} syslog {disable|enable}`**

Example: **`set 3 syslog enable`**
The example will enable alarms and event messages to the external Syslog server, on the Router card in slot 3.

{rtr_card-addr}

The slot number (1-8) that contains the Router card.

{disable|enable}

disable	Disable Syslog protocol
enable	Enable Syslog protocol

set (router) syslog facility

Use the **set (router) syslog facility** command to set the Syslog facility value that the Router card will report to a syslog server in each message.

Syntax: **`set {rtr_card-addr} syslog facility {value}`**

Example: **`set 3 syslog facility 16`**
The example will set the Syslog facility value to 16, on the Router in slot 3.

{rtr_card-addr}

The slot number (1-8) that contains the Router card.

{value}

The range of valid facility values is from 0 to 23, with a default of 16 (local use 0).

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set (router) syslog level

Use the **set (router) syslog level** command to set the Syslog severity level. Events of all severity levels lower in number (more severe) will be sent to the Syslog server.

Syntax: **`set {rtr_card-addr} syslog level {severity}`**

Example: **`set 3 syslog level 4`**
The example will set the Syslog severity level to 4, on the Router card in slot 3.

{rtr_card-addr}

The slot number (1-8) that contains the Router card.

{severity}

The severity threshold level can range from 0 to 7.

set (router) syslog server

Use the **set (router) syslog server** command to set the IP address of an external Syslog server.

Syntax: **`set {rtr_card-addr} syslog server {ip-addr}`**

Example: **`set 3 syslog server 10.0.0.1`**
The example will set the external Syslog server IP address to 10.0.0.1, on the Router card in slot 3.

{rtr_card-addr}

The slot number (1-8) that contains the Router card.

{ip-addr}

Set the IP address for the external Syslog server, using the form xxx.xxx.xxx.xxx, where xxx is a number from 0 to 255.

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set (router-lan) filter forward

Use the **set (router-lan) filter forward** command to specify the forwarding mode for Layer 2 filters on the LAN interface.

Syntax: `set {rtr_lan-addr} filter forward {matching|nontmatching}`

Example: `set 3:1 filter forward notmatching`

{rtr_lan-addr}

The Router address is in the form {slot:port} or {slot "profile-name"}.

slot	The slot number (1-8) that contains the Router card.
port	Port number of the Router.
"profile-name"	The profile name for the Router interface. Name must be enclosed in quotes, with a maximum length of 11 characters.

{matching|nontmatching}

matching	Only those frames matching a rule will be forwarded.
notmatching	Only those frames NOT matching a rule will be forwarded.

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set (router-lan) framing

Use the **set (router-lan) framing** command to specify which Ethernet frame types are supported on the LAN interface.

Syntax: **`set {rtr_lan-addr} framing {ipx|other} {ieee8022|ieee8023|ethii|snap} {disable|enable}`**

Example: **`set 3:1 framing ipx ieee8022 enable`**
The example will enable the 802.2 frame type for IPX packets on the LAN of the Router card in slot 3.

{rtr_lan-addr}

The Router address is in the form {slot:port} or {slot "profile-name"}.

slot	The slot number (1-8) that contains the Router card.
port	Port number of the Router.
"profile-name"	The profile name for the Router interface. Name must be enclosed in quotes, with a maximum length of 11 characters.

{ipx|other}

ipx	Enable or disable a frame type for the IPX protocol
other	Enable or disable a frame type for protocols other than IP and IPX

{ieee8022|ieee8023|ethii|snap}

ethii	Ethernet II framing
ieee8022	IEEE 802.2 framing
ieee8023	IEEE 802.3 framing
snap	LLC/SNAP framing

{disable|enable}

disable	Disable the frame type
enable	Enable the frame type

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set (router-lan) gateway

Use the **set (router-lan) gateway** command to specify a default IP gateway for the specified LAN interface. If there is no static network entry to 0.0.0.0, then this address is used as the default gateway for packets with no explicit route.

Syntax: **`set {rtr_lan-addr} gateway {ip-addr}`**

Example: **`set 3:1 gateway 192.168.201.144`**
The example will set the local LAN interface on slot 3 to use a default gateway at IP address 192.168.201.144.

{rtr_lan-addr}

The Router address is in the form {slot:port} or {slot "profile-name"}.

slot	The slot number (1-8) that contains the Router card.
port	Port number of the Router.
"profile-name"	The profile name for the Router interface. Name must be enclosed in quotes, with a maximum length of 11 characters.

{ip-addr}

The IP address of the gateway, in the form of xxx.xxx.xxx.xxx, where xxx is between 0-255.

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set (router-lan) ip address

Use the **set (router-lan) ip address** command to specify an IP address for the specified LAN interface. When first installed the Router card's LAN interface has a default IP address of 10.0.0.1 with subnet mask of 255.0.0.0.

Syntax: **`set {rtr_lan-addr} ip address {ip-addr} [mask]`**

Example: **`set 3:1 ip address 192.168.202.244 255.255.255.0`**
The example will set the local LAN interface on slot 3 to IP address 192.168.202.244, with a subnet mask of 255.255.255.0.

{rtr_lan-addr}

The Router address is in the form {slot:port} or {slot "profile-name"}.

slot	The slot number (1-8) that contains the Router card.
port	Port number of the Router.
"profile-name"	The profile name for the Router interface. Name must be enclosed in quotes, with a maximum length of 11 characters.

{ip-addr}

The Router IP address, in the form of xxx.xxx.xxx.xxx, where xxx is between 0-255.

[mask]

The subnet mask, in the form of xxx.xxx.xxx.xxx, where xxx is between 0-255.

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set (router-lan) ipx network

Use the **set (router-lan) ipx network** command to specify IPX network numbers for the four IPX LAN frame types. This enables the Axxius to Router IPX to Remote (WAN) networks, even if an IPX server does not exist on the local LAN. Typically, the Axxius will learn its external network number. However, if the local LAN does not have a server or if the IPX RIP setting is set to <Neither>, and you wish to Router IPX to Remote (WAN) networks, the external network number must be defined.

Syntax: **`set {rtr_lan-addr} ipx network {ieee8022|ieee8023|ethii|snap} {network}`**

Example: **`set 3:1 ipx network ieee8022 000000f1`**
The example will set the local LAN interface on slot 3 to IP address 192.168.202.244, with a subnet mask of 255.255.255.0.

{rtr_lan-addr}

The Router address is in the form {slot:port} or {slot "profile-name"}.

slot	The slot number (1-8) that contains the Router card.
port	Port number of the Router.
"profile-name"	The profile name for the Router interface. Name must be enclosed in quotes, with a maximum length of 11 characters.

{ieee8022|ieee8023|ethii|snap}

ethii	Ethernet II framing
ieee8022	IEEE 802.2 framing
ieee8023	IEEE 802.3 framing
snap	LLC/SNAP framing

{network}

External IPX network, specified as an 8-digit hexadecimal number.

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set (router-lan) phy

Use the **set (router-lan) phy** command to specify the Ethernet PHY (physical specifications) speed and mode.

NOTE: It is highly recommended that this setting be left at auto-negotiation. Connecting Ethernet devices with incompatible setting can lead to severe network performance degradation, increased collisions, late collisions, CRC errors, and undetected data corruption.

Syntax: **`set {rtr_lan-addr} phy {setting}`**

Example: **`set 3:1 phy full100`**
The example will force the Ethernet PHY to 100 MHz full-duplex on the Router in slot 3.

{rtr_lan-addr}

The Router address is in the form {slot:port} or {slot "profile-name"}.

slot	The slot number (1-8) that contains the Router card.
port	Port number of the Router.
"profile-name"	The profile name for the Router interface. Name must be enclosed in quotes, with a maximum length of 11 characters.

{setting}

auto	Auto-negotiate (highly recommended).
full10	10 MHz full-duplex.
full100	100 MHz full-duplex.
half10	10 MHz half-duplex.
half100	100 MHz half-duplex.

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set (router-lan) rip

Use the **set (router-lan) rip** commands to specify RIP for the specified LAN interface.

set (router-lan) rip ip

Use the **set (router-lan) rip ip** command to specify the IP RIP for the specified LAN interface.

Syntax: **`set {rtr_lan-addr} rip ip {both|neither|recv|send}`**

Example: **`set 2:1 rip ip send`**
The example will set RIP on the local LAN interface on slot 2 to send.

{rtr_lan-addr}

The Router address is in the form {slot:port} or {slot "profile-name"}.

slot	The slot number (1-8) that contains the Router card.
port	Port number of the Router.
"profile-name"	The profile name for the Router interface. Name must be enclosed in quotes, with a maximum length of 11 characters.

{both|neither|recv|send}

both	Enable IP RIP (or IPX RIP and SAP) in both directions.
neither	Shut IP RIP (or IPX RIP and SAP) off completely.
recv	Enable IP RIP (or IPX RIP and SAP) in the receive direction only.
send	Enable IP RIP (or IPX RIP and SAP) in the send direction.

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set (router-lan) rip ipx

Use the **set (router-lan) rip ipx** command to specify the IPX RIP and SAP for the specified LAN interface.

Syntax: **`set {rtr_lan-addr} rip ipx {both|neither|recv|send}`**

Example: **`set 2:1 rip ipx send`**

The example will set RIP and SAP on the local LAN interface on slot 2 to send.

{rtr_lan-addr}

The Router address is in the form {slot:port} or {slot "profile-name"}.

slot	The slot number (1-8) that contains the Router card.
port	Port number of the Router.
"profile-name"	The profile name for the Router interface. Name must be enclosed in quotes, with a maximum length of 11 characters.

{both|neither|recv|send}

both	Enable IPX RIP (or IPX RIP and SAP) in both directions.
neither	Shut IPX RIP (or IPX RIP and SAP) off completely.
recv	Enable IPX RIP (or IPX RIP and SAP) in the receive direction only.
send	Enable IPX RIP (or IPX RIP and SAP) in the send direction.

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set (router-lan) stp

Use the **set (router-lan) stp** commands to configure the Spanning Tree Protocol on this interface.

set (router-lan) stp enable/disable

Use the **set (router-lan) stp enable/disable** command to enable/disable Spanning Tree Protocol on this interface. To enable STP on an interface it must be enabled globally with the **set (router) stp enable** command.

Syntax: **`set {rtr_lan-addr} stp {disable|enable}`**

Example: **`set 3:1 stp enable`**
The example will enable Spanning Tree on the LAN for this interface.

{rtr_lan-addr}

The Router address is in the form {slot:port} or {slot "profile-name"}.

slot	The slot number (1-8) that contains the Router card.
port	Port number of the Router.
"profile-name"	The profile name for the Router interface. Name must be enclosed in quotes, with a maximum length of 11 characters.

{disable|enable}

disable	Disable Spanning Tree on this interface.
enable	Enable Spanning Tree on this interface.

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set (router-lan) stp port cost

Use the **set (router-lan) stp port cost** command to configure Spanning Tree path cost value for this bridge port.

Syntax: **`set {rtr_lan-addr} stp port cost {port-cost-value}`**

Example: **`set 3:1 stp port cost 100`**
Sets the Spanning Tree port cost value at 100, on the Router in slot 3.

{rtr_lan-addr}

The Router address is in the form {slot:port} or {slot "profile-name"}.

slot	Slot number (1-8) that contains the Router card.
port	Port number of the Router.
"profile-name"	The profile name for the Router interface. Name must be enclosed in quotes, with a maximum length of 11 characters.

{port-cost-value}

The value can range from 1 to 65535, higher values represent slower data paths. For a 100 Mb LAN a value of 19 is recommended. For a 10 Mb LAN a value of 100 is recommended.

set (router-lan) stp port priority

Use the **set (router-lan) stp port priority** command to configure Spanning Tree priority value for this bridge port.

Syntax: **`set {rtr_lan-addr} port priority {port-priority-value}`**

Example: **`set 3:1 stp port priority 128`**
The example will set the STP port priority to 128, on the Router in slot 3.

{rtr_lan-addr}

The Router address is in the form {slot:port} or {slot "profile-name"}.

slot	Slot number (1-8) that contains the Router card.
port	Port number of the Router.
"profile-name"	The profile name for the Router interface. Name must be enclosed in quotes, with a maximum length of 11 characters.

{port-priority-value}

Spanning Tree port priority for this bridge port. Range from 0 to 255, with a default of 128.

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set (router-lan) up/down

Use the **set (router-lan) up/down** command to set the specified LAN interface up or down. When the Router port is set down, a link failure will not cause an alarm. This can be used to eliminate alarms from Router ports that are not in-use. When the Router port is set up, a link failure on the Ethernet port will cause an alarm to be reported to the Axxius 800.

Syntax: **`set {rtr_lan-addr} {down|up}`**

Example: **`set 2:1 down`**

The example will set the local LAN interface on slot 2 down.

{rtr_lan-addr}

The Router address is in the form {slot:port} or {slot "profile-name"}.

slot	Slot number (1-8) that contains the Router card.
port	Port number of the Router.
"profile-name"	The profile name for the Router interface. Name must be enclosed in quotes, with a maximum length of 11 characters.

{down|up}

down	Set the Router as Out-of-Service. This command turns off the LED and disables alarm reporting for the Router specified.
up	Set the Router as In-Service. This command turns on the LED and enables alarm reporting for the Router specified.

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set (router-trunk) encapsulation

Use the **set (router-trunk) encapsulation** command to specify the encapsulation to use on the TSR interface.

Syntax: **`set {rtr_trunk-addr} encapsulation {setting}`**

Example: **`set 2:1:5 encapsulation pppofr`**
The example will configure encapsulation on the Router card in slot 2, port 1, trunk 5 to PPP over.

{rtr-trunk-addr}

slot	Slot number (1-8) that contains the Router card
port	Port number of the Router
trunk	Trunk number for this port, 1-24

{setting}

fr	Frame Relay as per RFC 2427
ppp	Point-to-Point Protocol (PPP) as per RFC 1661 and 1662
pppofr	PPP over Frame Relay as per RFC 1973

set (router-trunk) multilink group

Use the **set (router-trunk) multilink group** command to specify a Router trunk to be part of a multilink PPP group. Note: It is recommended, for performance, that all of the individual links in the multilink group have approximately the same bandwidth.

Syntax: **`set {rtr-trunk-addr} multilink group {number}`**

Example: **`set 3:1:1-2 multilink group 1`**
The example will form a multilink PPP group that combines trunk 1 and 2.

`set 3:1:3 multilink group`
The example will add a third trunk to the multilink PPP group from above.

{rtr-trunk-addr}

slot	Slot number (1-8) that contains the Router card
port	Port number of the Router
trunk	Trunk number for this port, 1-24

{number}

The multilink group number. Range is 1-24.

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set (router-trunk) speed

Use the **set (router-trunk) speed** command to specify the data speed for each DS0 in the given trunk. This command takes effect upon transition of the trunk to active. This command applies to the TSR card only.

Syntax: **`set {tsr-trunk-addr} speed {56|64}`**

Example: **`set 3:1:23 speed 56`**
The example will set the data speed of trunk 23 in the TSR in slot 3 to 56 Kbps.

{tsr-trunk-addr}

slot	Slot number (1-8) that contains the TSR card
port	Port number of the Router
trunk	Trunk number for this port, 1-24

{56|64}

56	56 Kbps data speed
64	64 Kbps data speed. 64 is the default.

set (router-trunk) up/down

Use the **set (router-trunk) up/down** command to set the WAN trunk up or down. When the Router trunk is set down a link failure will not cause an alarm. This can be used to eliminate alarms from Router trunks that are not in-use. When the Router trunk is set up, a link failure on the WAN trunk will cause an alarm to be reported to the Axxius.

Syntax: **`set {rtr_trunk-addr} {down|up}`**

Example: **`set 2:1:1 down`**
The example will set the first Router trunk interface on slot 2 down.

{rtr-trunk-addr}

slot	Slot number (1-8) that contains the Router card
port	Port number of the Router
trunk	Trunk number for this port, 1-24

{up|down}

down	Set the WAN down.
up	Set the WAN up.

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set (router-wan) dlci

Use the **set (router-wan) dlci** command to set the DLCI (Data Link Connection Identifier) for a specified WAN interface.

Syntax: **`set {rtr_card-addr} {"wan-name"} dlci {value}`**

Example: **`set 1 "LosAngeles" dlci 16`**
The example will set the WAN interface named "LosAngeles" on the Router card in slot 1 to use DLCI value 16.

{rtr_card-addr}

The slot number (1-8) that contains the Router card.

{"wan-name"}

The WAN interface to modify. The name must be enclosed in quotes.

{value}

DLCI value to use, 16-1022

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set (router-wan) gre

Use the **set (router-wan) gre** command to configure Generic Routing Encapsulation tunneling for a specified WAN interface.

set (router-wan) gre address

Use the **set (router-wan) gre address** command to configure the IP addresses for GRE tunneling for a specified WAN interface.

Syntax: **`set {rtr_card-addr} {"wan-name"} gre address {local_ip-addr} [remote-ip-addr] ["tunnel-name"]`**

Example: **`set 3 "LosAngeles" gre address 10.0.0.0 20.0.0.0 "LATunnel"`**

The example will set the WAN interface named "LosAngeles" to the IP addresses to be 10.0.0.0 and 20.0.0.0.

Note: A **set 3 "LosAngeles" gre ip all** command is required before this command.

{rtr_card-addr}

The slot number (1-8) that contains the Router card.

{"wan-name"}

The WAN interface to modify. The name must be enclosed in quotes.

{local-ip-addr}

The IP Address of the local end of the tunnel, in the form of xxx.xxx.xxx.xxx, where xxx is between 0-255.

[remote-ip-addr]

The IP Address of the far end of the tunnel, required if GRE tunneling is set to All, prohibited if GRE tunneling is set to By Network. In the form of xxx.xxx.xxx.xxx, where xxx is between 0-255.

["tunnel-name"]

A symbolic name to give to this tunnel, required if GRE tunneling is set to All, prohibited if GRE tunneling is set to By Network. Up to 12 characters, enclosed in quotes.

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set (router-wan) gre ip

Use the **set (router-wan) gre ip** command to configure the GRE tunneling of the IP protocol for a specified WAN interface.

Syntax: **`set {rtr_card-addr} {"wan-name"} gre ip {all|bynetwork|disable}`**

Example: **`set 3 "LosAngeles" gre ip all`**
The example will set the WAN interface "LosAngeles" in slot 3, to pass all packets through a GRE tunnel.

{rtr_card-addr}

The slot number (1-8) that contains the Router card.

{"wan-name"}

The WAN interface to modify. The name must be enclosed in quotes.

{all|bynetwork|disable}

all	Tunnel all packets on this interface to the tunnel destination address.
bynetwork	Tunnel packets based on their destination address by matching GRE network entries, see *add (router-wan) gre network* command.
disable	Disable GRE tunneling.

set (router-wan) gre ipx

Use the **set (router-wan) gre ipx** command to configure the GRE tunneling of the IPX protocol for a specified WAN interface.

Syntax: **`set {rtr_card-addr} {"wan-name"} gre ipx {all|disable}`**

Example: **`set 3 "LosAngeles" gre ipx all`**
The example will set the WAN interface named "LosAngeles" in slot 3, to pass all IPX packets through a GRE tunnel.

{rtr_card-addr}

The slot number (1-8) that contains the Router card.

{"wan-name"}

The WAN interface to modify. The name must be enclosed in quotes.

{all|disable}

all	Tunnel all packets on this interface to the tunnel destination address.
disable	Disable GRE tunneling.

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set (router-wan) ip

Use the **set (router-wan) ip** command to set the IP traffic handling on the WAN interface.

Syntax: **`set {rtr_card-addr} {"wan-name"} ip {block|bridge|route}`**

Example: **`set 1 "LosAngeles" ip route`**
Sets the WAN interface named "LosAngeles" on the Router in slot 1 to route IP.

{rtr_card-addr}

The slot number (1-8) that contains the Router card.

{"wan-name"}

The WAN interface to modify. The name must be enclosed in quotes.

{block|bridge|route}

block	Set the WAN to block IP.
bridge	Set the WAN to bridge IP.
route	Set the WAN to route IP.

set (router-wan) ip address

Use the **set (router-wan) ip address** command to set the IP address for a WAN interface.

Syntax: **`set {rtr_card-addr} {"wan-name"} ip address {ip-addr} [mask]|unnumbered}`**

Example: **`set 1 "LosAngeles" ip address 100.2.2.2 255.255.255.0`**
The example will set the WAN interface named "LosAngeles" on the Router in slot 1 to the IP address 100.2.2.2, with a subnet mask of 255.255.255.0.

{rtr_card-addr}

The slot number (1-8) that contains the Router card.

{"wan-name"}

The WAN interface to modify. The name must be enclosed in quotes.

{ip-addr}

Router IP address, in the form of xxx.xxx.xxx.xxx, where xxx is between 0-255.

[mask]

The subnet mask, in the form of xxx.xxx.xxx.xxx, where xxx is between 0-255.

{unnumbered}

Treat this as an un-numbered interface, as per RFC 1812.

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set (router-wan) ipx

Use the **set (router-wan) ipx** command to set the IPX traffic handling on the specified WAN interface.

Syntax: **`set {rtr_card-addr} {"wan-name"} ipx {setting}`**

Example: **`set 1 "LosAngeles" ipx bridge`**
The example will set the WAN interface named "LosAngeles" in slot 1, to bridge IPX.

{rtr_card-addr}

The slot number (1-8) that contains the Router card.

{"wan-name"}

The WAN interface to modify. The name must be enclosed in quotes.

{setting}

block	Set the WAN to block IPX.
bridge	Set the WAN to bridge IPX with optimized local advertising IPX servers and networks.
optimize	Set the WAN to bridge IPX with optimized local advertising of IPX servers and networks. Setting to **optimize** enables the Axxius to use Carrier Access' network optimization feature, which ensures that only necessary data is transmitted over the WAN connection. The Axxius will initiate IPX learning mode. Learning mode is effective for optimizing bandwidth usage for IPX RIP, SAP, serialization and watchdog (IPX and SPX) packets. If you choose this option, the Axxius will initiate learning mode in order to gain knowledge of local and remote networks and services. Once it knows of remote networks and services, it can advertise the information on the local LAN on behalf of the remote networks and servers.

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set (router-wan) nat

Use the **set (router-wan) nat** commands to configure Network Address Translation (NAT) on a specified WAN interface.

set (router-wan) nat address

Use the **set (router-wan) nat address** command to configure Network Address Translation (NAT) public addresses for a specified WAN interface.

Syntax: **`set {rtr_card-addr} {"wan-name"} nat address {assigned|ip-addr} [count]`**

Example: **`set 1 "LosAngeles" nat address 201.17.172.11 8`**
The example will set the WAN interface named "LosAngeles" on the Router in slot 1 to perform NAT translation to one of 8 public address from 201.17.172.11 to 201.17.172.19.

{rtr_card-addr}

The slot number (1-8) that contains the Router card.

{"wan-name"}

The WAN interface to modify. The name must be enclosed in quotes.

{assigned|ip-addr}

assigned	The NAT address assigned by remote.
ip-addr	The Router IP address, in the form of xxx.xxx.xxx.xxx, where xxx is between 0-255.

[count]

An optional field defining the number of public addresses in the NAT pool. Default is 1

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set (router-wan) nat enable/disable

Use the **set (router-wan) nat** command to enable and disable Network Address Translation (NAT) on a specified WAN interface.

Syntax: **`set {rtr_card-addr} {"wan-name"} nat {disable|enable}`**

Example: **`set 1 "LosAngeles" nat enable`**
The example will set the WAN interface named "LosAngeles" on the Router card in slot 1 to enable NAT mapping.

{rtr_card-addr}

The slot number (1-8) that contains the Router card.

{"wan-name"}

The WAN interface to modify. The name must be enclosed in quotes.

{disable|enable}

disable	Disable NAT mapping.
enable	Enable NAT mapping.

set (router-wan) nat ports

Use the **set (router-wan) nat ports** command to configure Network Address Translation (NAT) to dynamically map ports or preserve them. This field should only be set to "preserved" if an application that you are using requires a specific port number.

Syntax: **`set {rtr_card-addr} {"wan-name"} nat ports {dynamic|preserved}`**

Example: **`set 1 "LosAngeles" nat ports dynamic`**
The example will set the WAN interface named "LosAngeles" on the Router card in slot 1 to enable dynamic NAT port mapping.

{rtr_card-addr}

The slot number (1-8) that contains the Router card.

{"wan-name"}

The WAN interface to modify. The name must be enclosed in quotes.

{dynamic|preserved}

dynamic	Set NAT port mapping to be dynamic.
preserved	Preserve original port.

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set (router-wan) other

Use the **set (router-wan) other** command to set the traffic handling of protocols other than IP or IPX on the specified WAN interface.

Syntax: **`set {rtr_card-addr} {"wan-name"} other {block|bridge}`**

Example: **`set 1 "LosAngeles" other bridge`**
The example will set the WAN interface named "LosAngeles" in slot 1, to bridge other protocols.

{rtr_card-addr}

The slot number (1-8) that contains the Router card.

{"wan-name"}

The WAN interface to modify. The name must be enclosed in quotes.

{block|bridge}

block	Set the WAN to block protocols other than IP or IPX.
bridge	Set the WAN to bridge protocols other than IP or IPX.

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set (router-wan) ppp

Use the **set (router) ppp** command to configure the PPP (Point-to-Point Protocol) on the specified Router card.

set (router-wan) ppp auth ofremote user

Use the **set (router-wan) ppp auth ofremote user** command to set the CHAP or PAP name by which a remote PPP device is authenticated by this Axxius.

Syntax: **`set {rtr_card-addr} {"wan-name"} ppp auth ofremote user {profilename|"protocol-name"}`**

Example: **`set 5 "LosAngeles" ppp auth ofremote user profilename`**
The example will set the PPP authentication user name for the WAN interface named "LosAngeles" tin slot 1 to equal the profile name.

{rtr_card-addr}

The slot number (1-8) that contains the Router card.

{"wan-name"}

The WAN interface to modify. The name must be enclosed in quotes.

{profilename|"protocol-name"}

profilename	Use the profile name as the CHAP or PAP user name.
"protocol-name"	CHAP or PAP user name. Up to 16 characters, enclosed in quotes.

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set (router-wan) ppp compression

Use the **set (router-wan) ppp compression** command to configure the PPP compression with the remote PPP device.

Syntax: **`set {rtr_card-addr} {"wan-name"} ppp compression {setting}`**

Example: **`set 5 "LosAngeles" ppp compression enable`**
The example will set PPP to attempt to negotiate PPP compression on the WAN interface named "LosAngeles" in slot 1.

{rtr_card-addr}

The slot number (1-8) that contains the Router card.

{"wan-name"}

The WAN interface to modify. The name must be enclosed in quotes.

{setting}

disable	Disable PPP compression negotiation (default).
easy	Typical data on this interface is easy to compress, such as text files (default).
enable	Enable PPP compression negotiation.
hard	Typical data on this interface is hard to compress, such as binary files.

set (router-wan) ppp security server

Use the **set (router-wan) ppp security server** command to set the security server with the remote PPP device.

Syntax: **`set {rtr_card-addr} {"wan-name"} ppp security server {external|local}`**

Example: **`set 5 "LosAngeles" ppp security server local`**

{rtr_card-addr}

The slot number (1-8) that contains the Router card.

{"wan-name"}

The WAN interface to modify. The name must be enclosed in quotes.

{external|local}

external	PPP External Security Server
local	PPP Local Security Server

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set (router-wan) rip

Use the **set (router-wan) rip** commands to set the type of RIP updates on the WAN interface.

set (router-wan) rip ip updates

Use the set **(router-wan) rip ip updates** command to set the type of RIP updates on the specified WAN interface.

Syntax: **`set {rtr_card-addr} {"wan-name"} rip ip updates {never|periodic|triggered}`**

Example: **`set 1 "LosAngeles" rip ip updates never`**
The example will set the WAN interface named "LosAngeles" on the Router card in slot 1 to not sent RIP updates.

{rtr_card-addr} - The slot number (1-8) that contains the Router card.

{"wan-name"}

The WAN interface to modify. The name must be enclosed in quotes.

{setting}

never	Set the WAN to not send RIP updates.
periodic	Set the WAN to send periodic RIP updates.
triggered	Set the WAN to send triggered RIP updates.

set (router-wan) rip ipx updates

Use the **set (router-wan) rip ipx updates** command to set the type of IPX RIP updates on the specified WAN interface.

Syntax: **`set {rtr_card-addr} {"wan-name"} rip ipx updates {never|periodic|triggered}`**

Example: **`set 1 "LosAngeles" rip ipx updates never`**
Sets the WAN interface "LosAngeles" to not sent RIP updates.

{rtr_card-addr} - The slot number (1-8) that contains the TSR card.

{"wan-name"} - The WAN interface to modify. The name must be enclosed in quotes.

{setting}

never	Set the WAN to not send RIP updates.
periodic	Set the WAN to send periodic RIP updates.
triggered	Set the WAN to send triggered RIP updates.

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set (router-wan) stp

Use the **set (router-wan) stp** commands to configure the Spanning Tree Protocol on the specified WAN interface.

set (router-wan) stp enable/disable

Use the **set (router-wan) stp enable/disable** command to enable and disable Spanning Tree Protocol on this interface. To enable Spanning Tree on an interface it must first be enabled globally with the **set (router) stp enable** command and the WAN must be set to bridge the IP protocol.

Syntax: **`set {rtr_card-addr} {"wan-name"} stp {disable|enable}`**

Example: **`set 3 stp enable`**
The example will enable Spanning Tree on this interface.

{rtr_card-addr}

The slot number (1-8) that contains the Router card.

{"wan-name"}

The WAN interface to modify. The name must be enclosed in quotes.

{disable|enable}

disable	Disable Spanning Tree on this interface.
enable	Enable Spanning Tree on this interface.

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set (router-wan) stp port cost

Use the **set (router-wan) stp port cost** command to configure Spanning Tree path cost value for this bridge port.

Syntax: **`set {rtr_card-addr} {"wan-name"} stp port cost {port-cost-value}`**

Example: **`set 3 stp port cost 650`**
The example sets the Spanning Tree port cost value at 650, on the Router card in slot 3.

{rtr_card-addr}

The slot number (1-8) that contains the Router card.

{"wan-name"}

The WAN interface to modify. The name must be enclosed in quotes.

{port-cost-value}

The value can range from 1 to 65535, with higher values representing slower data paths. A value of 15625/# of DS0s is recommended.

set (router-wan) stp port priority

Use the **set (router-wan) stp port priority** command to configure Spanning Tree priority value for this bridge port.

Syntax: **`set {rtr_card-addr} {"wan-name"} port priority {port-priority-value}`**

Example: **`set 3 stp port priority 128`**
The example sets the Spanning Tree port priority to 128, on the Router in slot 3.

{rtr_card-addr}

The slot number (1-8) that contains the Router card.

{"wan-name"}

The WAN interface to modify. The name must be enclosed in quotes.

{port-priority-value}

The value can range from 0 to 255 seconds, with a default of 128.

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set (router-wan) trunk

Use the **set (router-wan) trunk** command to configure the trunk port or multilink group for a specified WAN interface. If the trunk encapsulation is subsequently changed, this trunk assignment is reset to 0.

Syntax: **`set {rtr_card-addr} {"wan-name"} trunk [multilink-group] {number}`**

Example: **`set 1 "LosAngeles" trunk 3`**
The example will set the WAN interface named "LosAngeles" on the Router card in slot 1 to be mapped to trunk 3.

{rtr_card-addr}

The slot number (1-8) that contains the Router card.

{"wan-name"}

The WAN interface to modify. The name must be enclosed in quotes.

[multilink-group]

This optional parameter, indicates that the number is the multilink group to use, else the number is the trunk number to use.

{number} - Number of the trunk or multilink group to use, range is 1-24.

set (router-wan) up/down

Use the **set (router-wan) up/down** command to set the specified WAN interface up or down.

Syntax: **`set {rtr_card-addr} {"wan-name"} {down|up}`**

Example: **`set 1 "LosAngeles" up`**
The example will enable the WAN interface named "LosAngeles" on the Router card in slot 1.

{rtr_card-addr}

The slot number (1-8) that contains the Router card.

{"wan-name"}

The WAN interface to modify. The name must be enclosed in quotes.

{down|up}

down	Set the Router WAN to disabled.
up	Set the Router WAN to enabled.

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set screen

Use the **set screen** command to set the height of the scrolling output screen, in number of lines. For example, if the screen height is set to 40 lines, the Command Line Interface (CLI) will print the maximum of 40 lines of a long output before pausing. To set the screen to scroll without pausing, set the screen height to 0.

Syntax: **`set screen {screen-height|off}`**

Where screen-height is the number of lines in the scrolling output screen.

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set snmp

Use the **set snmp** command to set the Simple Network Management Protocol (SNMP) MIB-II System Group objects.

Syntax: **`set snmp {setting} {"string"}`**
Where {setting} is as below, and {string} is its value.

Example: **`set snmp name "Axxius 1"`**
To set the SNMP system name to "Axxius 1"

Example: **`set snmp nms 2 192.168.3.50`**
Set the second SNMP NMS IP address to 192.168.3.50

{setting}

Set the values for any of the following SNMP MIB-II System Group object

contact {string}	SysContact. 1 - 255 characters, enclosed in quotes	
getcom {string}	SNMP Get-Community. 1 - 32 characters, enclosed in quotes	
location {string}	SysLocation. 1 - 255 characters, enclosed in quotes	
name {string}	Set the value of the SysName (name enclosed by quotes).	
nms {n} {ip-addr|none}	Set the IP address of the SNMP manager where the SNMP agent will send traps (up to 3 NMS addresses). The {n} is a number from 1 to 3, to differentiate your NMS addresses. none = no address set.	
setcom {string}	Set the value of the SNMP Set-Community string.	
trapauth {disable|enable}	Enable or disable authentication traps.	
trapcom {string}	Set the value for the SNMP Trap-Community string. 1 - 32 characters, enclosed in quotes	
trapevent {setting}	Set minimum severity level for (enterprise) event trap generation.	
	all	Set event trap severity limit to 'all'.
	critical	Set event trap severity limit to 'critical'.
	major	Set event trap severity limit to 'major'.
	minor	Set event trap severity limit to 'minor'.
	warning	Set event trap severity limit to 'warning'.
	none	Set event trap severity limit to 'none'.
trapvers {1|2}	Set SNMP trap version number, 1 or 2. Example: set snmp trapvers 1	

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set time

Use the **set time** command to set the time.

Syntax: **`set time {hh:mm:ss}`**

Example: **`set time 12:00:00`**
The example will set the time to 12 noon.

{hh:mm:ss}
Where hh:mm:ss is the time in hours, minutes, and seconds, using a 24-hour clock.

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set user

Use the **set user** command to modify attributes for a specific user that have been created with the **add user** command.

set user level

Use the **set user level** command to set the user access level.

Syntax: **`set user {"user-name"} level {1|2|3}`**

Example: **`set user "paul" level 2`**

{"user-name"}

The user-name is a user ID to add to the system. Text is a single word, with no blank spaces and must be enclosed in quotes.

{1| 2| 3}

Sets the level of access.

Level 1	Manager has full access to ALL commands. Typically, there is only one designated user at this level
Level 2	Operator has access to all commands except for the **add user** and **set user** commands
Level 3	Monitor (read only) has access to commands that display reports and status

set user password

Use the **set user password** to set the password for a defined user.

Syntax: **`set user {"user-name"} password`**

Example: **`set user "john" password [Enter]`**

```
New Password: ****
New Password again: ****
```

{"user-name"}

The user-name is an existing user ID in the system. Text is a single word, with no blank spaces and must be enclosed in quotes.

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set (v35)

Use the **set (v35)** command to setup V.35 ports. The command specifies the range of channels within that card, and the setting to apply.

Syntax: **`set {v35-addr} {setting}`**

Example: **`set 6:1 rxclk normal`**
To set port 1 (v.35) on slot 6 to no inversion on the receive clock

{v35-addr}

In the form of {slot:port}.

slot	Slot number (1-8) of the Axxius chassis where the V.35 card is located
port	Port number or range.

{setting}

Setting to apply one of the following:

clock	Set the clock source to one of the following:	
	external	to the external source
	source	to the internal Stratum 4E oscillator
cts	Set the Clear To Send operation mode to one of the following:	
	cd	follow CD
	high	force CTS high
	low	force CTS low
	rts	follow RTS
data	Set the data mode to one of the following:	
	invert	invert the receive and transmit data
	normal	do not invert receive and transmit data
equipment	Sets the V.35 port to equipment loopback, which loops the transmit V.35 signal back toward the V.35 receive (toward the T1)	
	loopdown	disable equipment loopback
	loopup	enable equipment loopback
line	Sets the V.35 port to line loopback, which loops the received V.35 signal back toward the V.35 signal toward the V.35 transmit (away from T1)	
	loopdown	disable line loopback
	loopup	enable line loopback
rxclkinv	Set the receive clock invert mode to one of the following:	
	invert	invert the receive clock
	normal	do not invert the receive clock

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speed	Set the data rate for each DS0 to which a V.35 is crossconnected	
	56	56K data rate
	64	64K data rate
txclkinv	Set the transmit clock invert mode to one of the following:	
	invert	invert the transmit clock
	normal	do not invert the transmit clock

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set (v54)

Use the **set (v54)** command to setup V.54 Loopback Test Parameters. The command specifies the range of channels within that card, and the setting to apply.

Syntax: **`set {v54-addr} v54 {setting} [off|on] [n] [nnn]`**

Example: **`set 6:1 v54 equipment clear`**
The example will clear the loop test counter on the V.54 card in slot 6, port 1.

{v54-addr}

In the form of {slot:port}.

slot	Slot number (1-8) of the Axxius chassis where the V.35/54 card is located
port	Port number or range.

{setting}

equipment		Set the V.54 Equipment (Tx) parameters:
	address	**`Syntax: set {v54-addr} v54 equipment address {nnn}`** Set V.54 loop test address [nnn] Set the address to be tested. **[nnn] {nnn}** must be one of the following: 0 - 255.1, 3, 5, 7, 9, 11, 13, 15,17, 19, 21, 23, 25, 27, 29, 31, 37, 39, 43, 45, 47, 51, 53, 55, 59, 61, 63, 85, 87, 91, 95, 111, 119, 127, 255 (255 disables). See chart below.
	clear	**`Syntax: set{v54-addr} v54 equipment clear`** Clear the bit error rate counters during BER test
	ignoreack	**`Syntax: set{v54-addr} v54 equipment ignoreack {off|on}`** Ignore V.54 ACK check [offlon] Ignore acknowledge from remote equipment. This allows potential testing with non-compliant equipment by ignoring the acknowledge phase. **WARNING: When choosing this option, the V.35 card will no longer be compliant with the V.54 specification. Use for debug purposes only.**
	loopdown	**`Syntax: set{v54-addr} v54 equipment loopdown`** Stop the test sequence
	loopup	**`Syntax: set{v54-addr} v54 equipment loopup`** Start the test sequence

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	pattern	**Syntax: set{v54-addr} v54 equipment pattern {n}** Set V.54 test pattern **n** is from the following: 0 = QRSS pattern (default) 1 = 2047 pattern 2 = 2^{15} -1 pattern 3 = 2^{20} -1 pattern (QRSS with no bit stuffing)
	prepcnt	**Syntax: set {v54-addr} v54 equipment prepcnt {nnn}** Set V.54 Rx prep-pattern count {nnn} **nnn** = the number of times that the preparatory pattern must be received to be recognized.
network		Set the V.54 Network loop address.
	address	**Syntax: set {v54-addr} v54 network address {nnn}** Set the address of the port to {nnn}. **{nnn}** must be one of the following: 1, 3, 5, 7, 9, 11, 13, 15,17, 19, 21, 23, 25, 27, 29, 31, 37, 39, 43, 45, 47, 51, 53, 55, 59, 61, 63, 85, 87, 91, 95, 111, 119, 127, 255 (255 disables). See chart below.
	disable	**Syntax: set {v54-addr} v54 network disable** Disable V.54 loop test
	enable	**Syntax: set {v54-addr} v54 network enable** Enable V.54 loop test
	prepcnt	**Syntax: set {v54-addr} v54 network prepcnt {nnn}** Sets the preparatory pattern response count. **nnn** = the number of times that the preparatory pattern must be received to be recognized.

[nnn] chart

0x01 - 1	0x0F - 15	0x1D - 29	0x33 - 51	0x57 - 87
0x03 - 3	0x11 - 17	0x1F - 31	0x35 - 53	0x5B - 91
0x05 - 5	0x13 - 19	0x25 - 37	0x37 - 55	0x5F - 95
0x07 - 7	0x15 - 21	0x27 - 39	0x3B - 59	0x6F - 111
0x09 - 9	0x17 - 23	0x2B - 43	0x3D - 61	0x77 - 119
0x0B - 11	0x19 - 25	0x2D - 45	0x3F - 63	0xFF - 255*
0x0D - 14	0x1B - 27	0x2F - 47	0x55 - 85	

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set verification

Use the **set verification** command to enable or disable verification prompts.

Syntax: **`set verification {off|on}`**

Example: **`set verification off`**
The example will cause yes/no verification messages to be suppressed.

{off|on}

off	Turn yes/no verification prompts off.
on	Turn yes/no verification prompts on.

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show

The following show commands are linked to a detailed description of each command.

show (adpcm)
show autoexit
show (bri)
show cclabels
show clock
show connect
show connect adpcm
show date
show (ds0)
show (ds1)
show (ds3)
show ethernet
show external alarms
show (fxo)
show (fxsPS or fxsPSM)
show id
show image
show impedance
show ip
show ipds0
show login
show lsprotect
show ntp
show (ocudp)
show radius
show (router)
show (router) dhcp
show (router) dns
show (router) lmi
show (router) login
show (router) ntp
show (router) port
show (router) ppp
show (router) rip
show (router) snmp
show (router) stp
show (router) syslog
show (router) uploaduser
show (router-lan)
show (router-lan) filter
show (router-lan) static
show (router-lan) stp
show (router-wan)
show (router-wan) firewall
show (router-wan) nat bypass
show (router-wan) ppp
show (router-wan) static ip address
show (router-wan) static ip network
show (router-wan) static ipx network
show (router-wan) static mac address
show (router-wan) static nat address
show (router-wan) stp
show (router-wan) trunk
show screen
show snmp
show syslog
show time
show users
show (v35)
show (v54)

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show (adpcm)

Use the **show (adpcm)** command to display the settings for the ADPCM card.

Syntax: **show {adpcm-addr}**

Example: **> show 6:1**

```
 show 6:1
SLOT 6:
Settings for DS1  1:
    Circuit ID:              CAC DS1# 6:1
    Up/Down:                 UP
    Framing:                 ESF
    Line Coding:             B8ZS
    Line Build Out:          DSX-1 EQUALIZATION FOR 0-133 ft.
(CSU 0dB)
    Loop Code Detection:     ON
    Loopback:                OFF
    FDL Type:                None
    ADPCM:                   Enabled
    ADPCM Map:               2

    Performance Threshold Settings          15 min.     1 day
    unavailable seconds:                        0         0
    severely errored seconds:                   0         0
    errored seconds:                            0         0
    sev. errored frame seconds:                 0         0
    line errored seconds:                       0         0
    controlled slip seconds:                    0         0
    bursty errored seconds:                     0         0
    degraded minutes:                           0         0
    total linecode violations:                  0         0
    total pathcode violations:                  0         0
```

{adpcm-addr}

The ADPCM address is in the form {slot|slot:port}. Where {slot} displays information for all ports on the card, {slot:port} for only the defined port.

slot	Slot number (1-8) where the ADPCM card is located
port	Port number, range or all.

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show autoexit

Use the **show autoexit** command to display whether autoexit is on or off. If on, the time-out period is displayed.

Syntax: **show autoexit**

Example: **> show autoexit**

```
Autoexit is off.
```

show (bri)

Use the **show (bri)** command to display settings for BRIs.

Syntax: **show {bri-addr}**

Example: **> show 5:1**

The example will display the settings for port 1 (BRI) on slot 5.

```
SLOT 5:
Settings for BRI Port 1:
    Mode:                          LT3DS0
    Up/Down:                       UP
    CRV:                           0
    Performance Sync Source:       AXXIUS
    Auto Activate:                 OFF

    Performance Threshold Settings      1 hour    1 day
                                        ------    ------
    errored seconds:                        40      100
   severely errored seconds:           10    25
```

{bri-addr}

The BRI address is in the form {slot|slot:port}. Where {slot} displays information for all ports on the card, {slot:port} for only the defined port.

slot	Slot number (1-8) where the BRI card is located
port	Port number, range or all.

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show cclabels

The **show cclabels** command displays all user defined DS0 cross-connect labels.

Syntax: **show cclabels**

Example: **show cclabels**

```
> show cclabels

 Current DS0 Connection Labels:
  ----------    ----------    ----------    ----------    ----------
  'label1'      'label2'      'label3'      'label4'      'V35label'
  'test'
```

show clock

The **show clock** command displays the primary and secondary clocks.

Syntax: **show clock**

Example: **show clock**

This example will display the primary and secondary clock source.

```
> show clock
  Primary Master Transmit Clock Source:    Internal
  Secondary Transmit Clock Source:         Internal
```


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show connect

The **show connect** command displays the static connections for channels and ports.

Syntax: **show connect {slot|slot:port|slot:port:channel|slot:port:channel:sub-channel}**

Example: **show connect a:1:1-4**

```
 From          Desc                  Desc          To     Comment
A:01:01          DATA  DS0
A:01:02          DATA  DS0
A:01:03          DATA  DS0
A:01:04        DATA  DS0
```

{slot|slot:port|slot:port:channel|slot:port:channel|sub-channel}

slot	Slot number A is the Controller card or 1-8 for service cards.
port	Port number, range or all.
channel	Channel number, range or all.
sub-channel	Sub-channel number, range or all.

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show connect adpcm

The **show connect adpcm** command displays the connections for the ADPCM port.

Syntax: **show connect adpcm {adpcm-addr}**

Example: **show connect 1:1**

```
> show connect adpcm 1:1
    From              Desc                 Desc              To
 --------------  -------------      -------------     ----------
 1:01:01(01/02)    DATA    DS0 <--> DS0     DATA         1:04:01
 1:01:02(03/04)    DATA    DS0 <--> DS0     DATA         1:04:02
 1:01:03(05/06)    DATA    DS0 <--> DS0     DATA         1:04:03
 1:01:04(07/08)    DATA    DS0 <--> DS0     DATA         1:04:04
 1:01:05(09/10)    DATA    DS0 <--> DS0     DATA         1:04:05
 1:01:06(11/12)    DATA    DS0 <--> DS0     DATA         1:04:06
 1:01:07(13/14)    DATA    DS0 <--> DS0     DATA         1:04:07
 1:01:08(15/16)    DATA    DS0 <--> DS0     DATA         1:04:08
 1:01:09(17/18)    DATA    DS0 <--> DS0     DATA         1:04:09
 1:01:10(19/20)    DATA    DS0 <--> DS0     DATA         1:04:10
 1:01:11(21/22)    DATA    DS0 <--> DS0     DATA         1:04:11
 1:01:12(23/24)    DATA    DS0 <--> DS0     DATA         1:04:12
```

{adpcm-addr}

slot	The slot number (1-8) that contains the DS1 ADPCM card.
port	Port number is 1

show date

The **show date** command displays the date in *dd/mm/yyyy* format.

Syntax: **show date**

Example: **> show date**

```
date: 08/10/2002
```


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show (ds0)

The **show (ds0)** command displays settings for DS0s.

Syntax: **`show {ds0-addr}`**

Example: **`show a:2:1-2`**

In the following example, the **show (ds0)** command has queried slot A (Controller card), port 2, channels 1 through 2.

```
>show a:2:1-2
SLOT A:
Settings for DS1  1:   channel  1:
    Type:            DATA
SLOT A:
Settings for DS1  1:   channel  2:
    Type:            DATA
```

{ds0-addr}

The Controller DS0 addresses are different on the DS3 and DS1 Controller, however the DS0 address on the service cards does not change with Controller type (DS3 or DS1).

DS0 Address on a DS3 Controller in the form {slot:port:channel:sub-channel}		
	slot	A for the DS3 Controller card.
	port	Port number, range or all.
	ds1 channel	DS1 channel number, range or all.
	ds0 channel	DS0 channel number, range or all.
DS0 Address on a DS1 Controller or service cards (with DS1 or DS3 controller) in the form {slot:port:channel}		
	slot	A for the DS1 Controller card, or 1-8 for service cards.
	port	Port number, range or all.
	channel	Channel number, range or all.

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show (ds1)

The **show (ds1)** command displays settings for DS1s.

Syntax: **show {ds1-addr}**

Example: **show 1:1**

```
SLOT A:
Settings for DS1  1:
    Circuit ID:         CAC DS1# A:1
    Up/Down:            DOWN
    Framing:            ESF
    Line Coding:        B8ZS
    Line Build Out:     DSX-1 EQUALIZATION FOR 0-133 ft.(CSU 0dB)
    Loop Code Detection:ON
    Loopback:           OFF
    FDL Type:           None
    AIS Forwarding:     Enabled
    AIS DS1 List:       2:1, 3:1, 4:1, 5:1

    Performance Threshold Settings          15 min.     1 day
    unavailable seconds:                        0         0
    severely errored seconds:                   0         0
    errored seconds:                            0         0
    sev. errored frame seconds:                 0         0
    line errored seconds:                       0         0
    controlled slip seconds:                    0         0
    bursty errored seconds:                     0         0
    degraded minutes:                           0         0
    total linecode violations:                  0         0
    total pathcode violations:                  0         0
```

{ds1-addr}

The Controller DS1 addresses are different on the DS3 and DS1 Controller, however the DS1 address on the services cards does not change with Controller type (DS3 or DS1).

DS1 Address on a DS3 Controller in the form {slot:port:channel}		
	slot	A for the DS3 Controller card.
	port	Port number, range or all.
	channel	Channel number, range or all.
DS1 Address on a DS1 Controller or service cards (with DS1 or DS3 controller) in the form {slot:port}		
	slot	A for the DS1 Controller card, or 1-8 for service cards.
	port	Port number, range or all.

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show (ds3)

The **show (ds3)** command displays the current settings for a DS3.

Syntax: **show {ds3-addr}**

Example: **show a:1**

```
SLOT A:
Settings for DS3 Port 1:
    Circuit ID:                 CAC T3# A:1
    Up/Down:                    UP
    De-jitter Buffer:           OFF
    Framing:                    M23
    Transmit Clock:             NORMAL
    Loop Code Detection:        OFF
    Loopback:                   OFF
    Berthreshold:               0
    Protection Switching:       OFF
    Protection Reversion:       OFF
    Equipment ID:
    Location ID:
    Frame ID:
    Unit ID:
    Facility ID:
    Port Number:
    Generator Number:
    FE Equipment ID:
    FE Location ID:
    FE Frame ID:
    FE Unit ID:
    FE Facility ID:
    FE Port Number:
    FE Generator Number:

    Performance Threshold Settings          15 min.      1 day
    unavailable seconds:                      0            0
    sev. errored frame seconds:               0            0
    cbit sev. errored seconds:                0            0
    cbit errored seconds:                     0            0
    pbit sev. errored seconds:                0            0
    pbit errored seconds:                     0            0
    line errored seconds:                     0            0

    line code violations:                     0            0
    cbit code violations:                     0            0
    pbit code violations:                     0            0
```


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{ds3-addr}

In the form of {slot:port}.

slot	A for the controller card (DS3)
port	Port number or range.

show ethernet

The **show ethernet** command displays Ethernet and IP settings.

Example: **`show ethernet`**

```
> show ethernet

   IP Address and Mask:          198.162.3.196  255.255.255.0
   IP Address of the Gateway:    192.168.3.202
   MAC Address:                  00:E0:97:00:A9:33
```

show external alarms

The **show external alarms** command displays the external alarm setting.

Example: **`show external alarms`**

```
 > show external alarms

Alarm  Severity       Description

  1     Minor         User Alarm
  2     Minor         User Alarm
  3     Minor         User Alarm
  4     Minor         User Alarm
  5     Minor         User Alarm
  6     Minor         User Alarm
  7     Minor         User Alarm
  8     Minor         User Alarm
  9     Minor         User Alarm
 10     Minor         User Alarm
```


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show (fxo)

The **show (fxo)** command displays the settings for FXOs.

Syntax: **`show {fxo-addr}`**

Example: **`show 7:1`**

The example shows settings for port 1 on the FXO card i slot 7.

```
> show 7:1
SLOT 7:
Settings for FXO:   channel  1:
    Type:            VOICE
    Signaling:       LS
    RxGain:          -6    dB
    TxGain:          -3    dB
```

{fxo-addr}

In the form of {slot:port}.

slot	Location of the FXO card, slot 1-8.
port	Port number, range or "all".

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show (fxsPS or fxsPSM)

The **show (fxsPS or fxsPSM)** command displays the settings for the Single Channel POTS card without modem (FXS PS) or with modem (FXS PSM).

Syntax: **`show {fxsPS-addr|fxsPSM-addr}`**

Example: **`show 8:1`**

The example shows settings for the FXS PS card in slot 8.

```
> show 8:1
SLOT 8:
Settings for FXS:   channel  1:
    Type:            VOICE
    Signaling:       LS
    RxGain:          -6    dB
    TxGain:          -3    dB
```

{fxsPS-addr|fxsPSM-addr}

In the form of {slot:port}.

slot	Slot number (1-8) that the FXS PS card is located
port	Port number is 1.

show id

The **show id** command displays the system ID for the Axxius 800.

Syntax: **`show id`**

Example: **`show id`**

The example shows the ID of a Axxius 800 labeled "Axxius 8001"

```
Axxius 8001> show id
ID: Axxius 8001
```


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show image

The **show image** command displays the application images stored in the Controller or Router.

Syntax: **show [rtr_card-addr] image**

Example: **show image**

```
> show image

   App. Image: Ver=7.0 Fri Aug 29 06:40:42 2003 - ACTIVE
   App. Image: Ver=7.0 Thu Aug 14 13:01:18 2003 - BACKUP
```

Example: **show 5 image**

```
> show 5 image
SLOT 5:
   App. Image: Ver=1.30K    Fri Apr 09 11:53:13 2004 - ACTIVE
   App. Image: Ver=1.21H    Mon Mar 29 09:54:36 2004 - BACKUP
```

[rtr_card-addr]

The Router card slot number (1-8) to retrieve the image information from. **Note: If no slot number is entered, the image information is retrieved from the Controller.**

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show impedance

The **show impedance** command displays the impedance settings for FXS 5G card.

Syntax: **show impedance**

Example: **show impedance**

Index	Impedance	CODEC	Country
1	120 Ohms + (.110µF || 820 Ohms)	A-law	Norway
2	150 Ohms + (.047µF || 510 Ohms)	A-law	Malaysia
3	150 Ohms + (.072µF || 830 Ohms)	A-law	Belgium
4	200 Ohms + (.100µF || 680 Ohms)	A-law	China
5	215 Ohms + (.137µF || 1k Ohms)	A-law	France
6	220 Ohms + (.115µF || 820 Ohms)	A-law	Austria, Germany, Mexico, Switzerland
7	220 Ohms + (.120µF || 820 Ohms)	A-law	Australia
8	270 Ohms + (.120µF || 910 Ohms)	A-law	Finland
9	300 Ohms + (.220µF || 1k Ohms)	A-law	United Kingdom
10	370 Ohms + (.310µF || 620 Ohms)	A-law	New Zealand
11	400 Ohms + (.033µF || 500 Ohms)	A-law	Denmark
12	400 Ohms + (.050µF || 500 Ohms)	A-law	Greece
13	600 Ohms	A-law	Korea, Indonesia, Italy, Poland, Russia, Spain, Thailand, China
14	600 Ohms + 1.00µF	µ-law	Japan
15	600 Ohms + 1.50µF	A-law	Saudi Arabia
16	600 Ohms + 2.16µF	µ-law	Korea
17	800 Ohms	A-law	Netherlands
18	900 Ohms	A-law	Brazil
19	900 Ohms + 2.16µF	µ-law	USA, Taiwan

NOTE: Note: In general, µ-Law settings are used for T1 applications, A-Law settings are used for E1 applications.

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show ip

The **show ip** command displays the IP Address information for the Axxius 800.

Syntax: **show ip**

Example: **show ip**

```
  IP Address and Mask:          192.168.3.193  255.255.255.0
  IP Address of the Gateway:    192.168.3.202
OK
```

show ipds0

The **show ipds0** command displays the settings for the DS0 management channel.

Syntax: **show ipds0**

Example: **show ipsd0**

```
Administrative state:   DOWN
DS0 Selected:           a:1:1
IP Address and Mask:    192.168.210.1  255.255.255.0
```

show login

The **show login** command displays the RADIUS login authentication configuration settings for the Controller.

Syntax: **show login**

Example: **show login**

```
Login Authentication Parameters:

Authentication Type: local
Support Logins: enabled
```


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show lsprotect

The **show lsprotect** command displays the low speed protection information.

Syntax: **show lsprotect**

Example: **show lsprotect**

```
> SHOW lsprotect

                          Low Speed Protection Settings:

Low Speed Protection Global Service Enable: ENABLED

                              Backup Slot Settings:

                   Backup Slot: 7
             Backup Slot Type: Quad T1

                              Protected Port Settings:

            SLOT:   PORT:   TYPE:        REVERSION:      PRIORITY:
            -----   -----   -----        ----------      ---------
              3       1     QT1: T1    NONREVERTIVE        1
              3       2     QT1: T1    NONREVERTIVE        1
              3       3     QT1: T1    NONREVERTIVE        1
              3       4     QT1: T1    NONREVERTIVE        1
              5       1     QT1: T1    NONREVERTIVE        2
              6       1     QT1: T1    REVERTIVE           7
              6       2     QT1: T1    REVERTIVE           7
              6       3     QT1: T1    REVERTIVE           3
              6       4     QT1: T1    REVERTIVE           7

Number of Protected Ports: 9
```


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show ntp

The **show ntp** command displays settings for Network Time Protocol.

Syntax: **show ntp**

Example: **show ntp**

```
NTP Settings:
  NTP:                                          Disabled
  NTP Server Address:                      0.0.0.0
  NTP Polling Interval (seconds):     16
  NTP Timezone (offset from GMT): 0 hours 0 minutes
```

show (ocudp)

Use the **show (ocudp)** to display baud, loopdetect, error correction, switched and enhanced switched service and secondary channel provisioning.

Syntax: **show {ocudp-addr}**

Example: **show 2:1**

```
SLOT 2:
Settings for OCUDP Port 1:
    Up/Down:                            UP
    Baudrate:                           56000
    Loopdetect Types Enabled:
                                CSU Non-Latching
                                DSU Non-Latching
                                OCU Non-Latching
    Error Correction:                   DISABLE
    Secondary Channel:                  DISABLE
```

{ocudp-addr}

The {slot:port} address of the OCU-DP card to display.

slot	Slot number (1-8) where the OCU-DP is located. If no port is specified, all ports will be displayed.
port	Port number or range.

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show radius

The **show radius** command displays the RADIUS configuration settings for the Controller.

Syntax: **show radius**

Example: **show radius**

```
RADIUS Configuration Parameters:

 Authentication: disabled
 NAS Identifier:
 Retry count:    3
 Timeout (sec):  3
 Server(1) :     UNUSED
 Server(2) :     UNUSED
 Server(3) :     UNUSED
```


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show (router)

The **show (router)** command displays the settings for the Router card.

Syntax: **`show {rtr_card-addr}`**

Example: **`show 1`**

```
SLOT 1:
LMI Settings for Router:
    LMI:            Disabled

RIP Setting for Router:
    RIP Mode Receive:    RIP1
    RIP Mode Send:       RIP1

PPP Authentication/Security Settings for Router:
    Authentication by Remote:
        Protocol:        None
        User ID:         Local Profile Name

    Authentication of Remote:
        Protocol:        None

    Local Security Server:
        Type:            None

PPP Statistics for Slot-1:

                    Up/Down     x          Rx          Tx          Tx
Remote Name  State  Time       Packets    Octets      Packets     Octets
RemoteUnit   DOWN   5m19s        0          0           0           0

SNMP Settings for Router:
  SNMP Communities:
    Name          Address           Access
    public        0.0.0.0           Read

  SNMP Trap Destinations:
    Name          Address           Location
    public        0.0.0.0           Local LAN

  Name:                   unknown
  Contact:                unknown
  Location:               unknown

DHCP Server/BOOTP Relay Agent Settings for Router:
    DHCP:                 Disabled

DNS Proxy Settings for Router:
    Total: 0
```


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```
Spanning Tree Protocol Settings for Router:
    Spanning Tree:       Disabled

Syslog Settings for Router:
    Syslog:              Disabled

TFTP Upload/Download User Settings for Router:
    Reboot After Code is Loaded:              Yes
    Reboot After Configuration is Loaded:     Yes

                                        Upload/Download
    IP Address        Client Site    Code    Config
    Total: 0

LAN Profile Name for Router:
    LocalUnit           10.0.0.1

WAN Profile Name(s) for Router:
    RemoteUnit          Unnumbered
```

{rtr_card-addr}

The slot number (1-8) that contains the Router card.

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show (router) dhcp

The **show (router) dhcp** command displays the current DHCP settings for the Router card.

Syntax: **show {rtr_card-addr} dhcp**

Example: **show 5 dhcp**

The following 3 examples, shows there is different information is displayed depending on the settings.

```
> show 5 dhcp
SLOT 5:
DHCP Server/BOOTP Relay Agent Settings for Router:
   DHCP: Disabled

> show 5 dhcp
SLOT 3:
DHCP Server/BOOTP Relay Agent Settings for Router:
  DHCP/BOOTP Relay Agent:  Enabled
    BOOTP Relay Servers:   192.168.1.1      at RemoteUnit
                           0.0.0.0          at RemoteUnit

> show 5 dhcp
SLOT 3:
DHCP Server/BOOTP Relay Agent Settings for Router:
  DHCP Server:             Enabled
    Server Domain:
    Starting IP Address:   192.100.1.1
    Number:                25
    Lease Duration:        0:00
    Domain Name Servers:   0.0.0.0
                           0.0.0.0
                           0.0.0.0

  NetBIOS over TCP/IP Settings:
    Node Type:             0
    Scope:
    NetBIOS Name Servers:  0.0.0.0
                           0.0.0.0
```

{rtr_card-addr}

The slot number (1-8) that contains the Router card.

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show (router) dns

The **show (router) dns** command displays the current DNS setup for the Router card.

Syntax: **show {rtr_card-addr} dns**

Example: **show 3 dns**

```
> show 3 dns
SLOT 3:
DNS Settings:
    DNS Resolver:                 Disabled
    DNS Server 1 IP Address:      0.0.0.0
    DNS Server 2 IP Address:      0.0.0.0
    DNS Host Name:
    DNS Default Domain:           domaintest

    DNS Static Host List:
     Total: 0
```

{rtr_card-addr}

The slot number (1-8) that contains the Router card.

show (router) dns proxy

The **show (router) dns proxy** command displays the current DNS Proxy setup for the Router card.

Syntax: **show {rtr_card-addr} dns proxy**

Example: **show 3 dns proxy**

```
> show 3 dns proxy
SLOT 3:
DNS Proxy Settings for Router:
    Total: 0
```

{rtr_card-addr}

The slot number (1-8) that contains the Router card.

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show (router) lmi

The **show (router) lmi** command displays the current Local Management Interface (LMI) settings for the Router card.

Syntax: **show {rtr_card-addr} lmi**

Example: **show 5 lmi**

The example shows the LMI settings for the Router card in slot 5.

```
> show 5 lmi
SLOT 5:
LMI Settings for Router:
   LMI: Disabled
```

{rtr_card-addr}

The slot number (1-8) that contains the Router card.

show (router) login

The **show (router) login** command displays the Router login configuration.

Syntax: **show {rtr_card-addr} login**

Example: **show 1 login**

```
SLOT 1:
Login Settings for Router:
    Authentication:  Local
    Login Prompt:    Enabled
```

{rtr_card-addr}

The slot number (1-8) that contains the Router card.

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show (router) ntp

The **show (router) ntp** command displays settings for NTP options.

Syntax: **show {rtr_card-addr} ntp**

Example: **show 4 ntp**

The example shows the NTP options for the Router card in slot 4.

```
> show 4 ntp
SLOT 4:
NTP Settings for QTSR:
    NTP:                            Disabled
    NTP Server:                     0.0.0.0
    NTP  Interval (seconds):120
    NTP Timezone (offset from GMT):0 hours 0 minutes
```

{rtr_card-addr}

The slot number (1-8) that contains the Router card.

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show (router) port

The **show (router) port** command displays the current TSR ports configuration. This command applies to the Terminal Server Router card only.

Syntax: **`show {tsr_card-addr} port`**

Example: **`show 1 port`**

```
SLOT 1:
Port Profiles for Terminal Server Router:
    Port 1
    Name: none
    Type: RS-232
    Asynchronous Settings
    Socket: 10.10.11.1:23 TCP
       Baud Rate    9600
       Data Bits    8
       Stop Bits    1
       No Parity
       No Flowcontrol
    Port 2
    Name: none
    Type: RS-232
    Asynchronous Settings
    Socket: 10.10.11.2:23 TCP
       Baud Rate    9600
       Data Bits    8
       Stop Bits    1
       No Parity
       No Flowcontrol
    Port 3
    Name: none
    Type: Ethernet
    Port 4
    Name: none
    Type: Ethernet
```

{tsr_card-addr}

The slot number (1-8) that contains the TSR card.

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show (router) ppp

The **show (router) ppp** command displays the current Local PPP (Point-to-Point Protocol) authentication and security settings for the Router card.

Syntax: **show {rtr_card-addr} ppp**

Example: **show 5 ppp**

```
> show 5 ppp
SLOT 5:
PPP Authentication/Security Settings for Router:
    Authentication by Remote:
        Protocol:        CHAP
        Secret:          public
        User ID:         Local Profile Name

    Authentication of Remote:
        Protocol:        CHAP

    Local Security Server:
        Type:            Radius
        IP Address:      168.0.0.100
        Password:        test
PPP Statistics for Slot-4:

                    Up/Down    Rx         Rx        Tx         Tx
Remote Name  State Time       Packets   Octets   Packets    Octets
-----------  ----- ---------  ---------- --------- ---------  -----
RemoteAxxius   DOWN  26m36s        0         0         0          0
```

{rtr_card-addr}

The slot number (1-8) that contains the Router card.

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show (router) rip

The **show (router) rip** command displays the current RIP settings for the Router card.

Syntax: **show {rtr_card-addr} rip**

Example: **show 5 rip**

```
SLOT 5:
RIP Settings for Router:
   RIP Mode Receive:   RIP2
   RIP Mode Send:      Rip2
```

{rtr_card-addr}

The slot number (1-8) that contains the Router card.

show (router) snmp

The **show (router) snmp** command displays the current SNMP settings for the specified Router card.

Syntax: **show {rtr_card-addr} snmp**

Example: **show 5 snmp**

```
SLOT 5:
SNMP Settings for Router:
  SNMP Communities:
    Name          Address           Access
    public        0.0.0.0           Read

  SNMP Trap Destinations:
    Name          Address           Location
    public        0.0.0.0           Local LAN

  Statistics Averaging Interval:    1 min.

  Name:                    unknown
  Contact:                 unknown
  Location:                unknown
```

{rtr_card-addr}

The slot number (1-8) that contains the Router card.

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show (router) stp

The **show (router) stp** command displays the current Spanning Tree Protocol settings for the specified Router card.

Syntax: **show {rtr_card-addr} stp**

Example: **show 5 stp**

```
> show 5 stp
SLOT 5:
Spanning Tree Protocol Settings for Router:
    Spanning Tree:       Enabled
    Bridge Hello Time:     2 seconds
    Bridge Max Age:        20 seconds
    Bridge Forward Delay:  15 seconds
    Bridge Priority:       32768
```

{rtr_card-addr}

The slot number (1-8) that contains the Router card.

show (router) syslog

The **show (router) syslog** command displays the current Syslog setup for the Router card.

Syntax: **show {rtr_card-addr} syslog**

Example: **show 5 syslog**

```
> show 5 syslog
SLOT 5:
Syslog Settings for Router:
    Syslog:              Enabled
    Facility:              20
    Level:                 3
    Server IP Address:     192.168.3.3
```

{rtr_card-addr}

The slot number (1-8) that contains the Router card.

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show (router) uploaduser

The **show uploaduser** command displays the current list of users allowed to upload and download configuration and code files.

Syntax: **show {rtr_card-addr} uploaduser**

Example: **show 5 uploaduser**

```
> show 5 uploaduser
SLOT 5:
TFTP Upload/Download User Settings for Router:
    Reboot After Code is Loaded:              Yes
    Reboot After Configuration is Loaded:     Yes

                                        Upload/Download
    IP Address        Client Site    Code    Config
    ---------------   -----------    ----    ------
    Any               Axxius1          X       X
    Total: 1
```

{rtr_card-addr}

The slot number (1-8) that contains the Router card.

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show (router-lan)

The **show (router-lan)** command displays the settings for the router card.

Syntax: **show {rtr_lan-addr}**

Example: **show 3:1**

```
> show 3:1
SLOT 3:
Settings for TSR LAN 1:
  Profile Name:              LocalUnit
  Up/Down:                   UP
  Proxy:                     Disabled
  Physical link:             Automatic
  MAC Address:               00:E0:97:FF:FF:FE

    IP Settings:
     IP Address and Mask:    10.0.0.1            255.0.0.0
     Default Router:         0.0.0.0
     Enabled Frame Types:    Ethernet II
     RIP Direction:          Neither

    IPX Settings:
    Enabled Frame Types:   Ethernet II,IEEE 802.2,IEEE 802.3,SNAP
     RIP Direction:          Neither
     802.2  Ext. Network:    00000000
     Eth II Ext. Network:    00000000
     SNAP   Ext. Network:    00000000
     802.3  Ext. Network:    00000000

    Other Settings:
       Enabled Frame Types:   Ethernet II, IEEE 802.2, SNAP

LAN Spanning Tree Pro7tocol Settings for LocalUnit:
    Spanning Tree:            Disabled

Static IP Network Settings for LocalUnit:
    Total: 0

Static IPX Network Settings for LocalUnit:
    Total: 0

Static IP Address Settings for LocalUnit:
```


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```
    Total: 0
Static MAC Address Settings for LocalUnit:
    Total: 0

LAN Filters Enabled for LocalUnit:
    Forward Mode: Forward ALL Frames NOT Matching Filters

    Filter Type   Source/Dest   Filter Name
    Total: 0

LAN MAC Address Filters Defined for LocalUnit:
    Total: 0

LAN Protocol Filters Defined for LocalUnit:
    Total: 0

LAN Custom Filters Enabled Defined for LocalUnit:
    Total: 0

Settings for TSR WAN RemoteUnit:
    State:                    Enabled
    IP Settings:
        Mode:                 Route
        WAN Network Updates: Never
        GRE Tunneling:        Disabled

    IPX Settings:
        Mode:                 Blocked

    Other Settings:
        Mode:                 Blocked

    NAT Gateway:              Disabled
    WAN Numbered IP:          No
```

{rtr_lan-addr}

The Router address is in the form {slot:port} or {slot "profile-name"}.

slot	The slot number (1-8) that contains the Router card.
port	Port number of the Router.
"profile-name"	The profile name for the Router interface. Name must be enclosed in quotes, with a maximum length of 11 characters.

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show (router-lan) filter

The **show (router-lan) filter** command displays the current LAN Layer 2 data filters applied to the LAN on the specified Router card.

Syntax: **show {rtr_lan-addr} filter [address|all|custom|protocol]**

Example: **show 5:1 filter**

```
> show 5:1 filter
SLOT 5:
LAN Filters Enabled for Axxius50:
    Forward Mode: Forward ALL Frames NOT Matching Filters

    Filter Type   Source/Dest   Filter Name
    -----------   -----------   -----------
    Protocol                    XNSrule
    Protocol                    XNSrule
    Total: 2
```

Example: **show 5:1 filter all**

```
> show 5:1 filter all
SLOT 5:
LAN MAC Address Filters Defined for Axxius50:
    Total: 0


LAN Protocol Filters Defined for Axxius50:

    Protocol Name   Ethernet Value   IEEE Value
    -------------   --------------   ----------
    SPANTRE         0                42
    XNSrule         807              0
    XNSrule         807              0
    Total: 3


LAN Custom Filters Enabled Defined for Axxius50:
  Total: 0
```


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{rtr_lan-addr}

The Router address is in the form {slot:port} or {slot "profile-name"}

slot	The slot number (1-8) that contains the Router card.
port	Port number of the Router.
"profile-name"	The profile name for the Router interface. Name must be enclosed in quotes, with a maximum length of 11 characters.

[address|custom|protocol|all]

This setting will display the defined filter types of the specified filters.

address	Display Address filters only.
custom	Display Custom filters only.
protocol	Display Protocol filters only.
all	Display all the defined filters.

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show (router-lan) static

The **show (router-lan) static** commands to display the current list of static entries for the LAN on the specified Router card.

show (router-lan) static ip address

The **show (router-lan) static ip address** command displays the current list of static IP address entries for the LAN on the specified TSR card.

Syntax: **`show {rtr_lan-addr} static ip address`**

Example: **`show 5:1 static ip address`**

```
> show 5:1 static ip address
SLOT 5:
Static IP Address Settings for Axxius50:

    Device Name   IP Address
    -----------   ---------------
    Axxius122       120.0.0.10
    Total: 1
```

{rtr_lan-addr}

The Router address is in the form {slot:port} or {slot "profile-name"}.

slot	The slot number (1-8) that contains the Router card.
port	Port number of the Router.
"profile-name"	The profile name for the Router interface. Name must be enclosed in quotes, with a maximum length of 11 characters.

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show (router-lan) static ip network

The **show (router-lan) static ip network** command displays the current list of static IP network entries for the LAN on the specified Router card.

Syntax: **show {rtr_lan-addr} static ip network**

Example: **show 5:1 static ip network**

```
SLOT 5:
Static IP Network Settings for Adit50:

    Network          Subnet Mask      Metric   Next Gateway
    100.0.0.0        255.0.0.0        1        192.136.43.52
    Total: 1
```

{rtr_lan-addr}

The Router address is in the form {slot:port} or {slot "profile-name"}.

slot	The slot number (1-8) that contains the Router card.
port	Port number of the Router.
"profile-name"	The profile name for the Router interface. Name must be enclosed in quotes, with a maximum length of 11 characters.

show (router-lan) static ipx network

The **show (router-lan) static ipx network** command displays the current list of static IPX network entries for the LAN on the specified Router card.

Syntax: **show {rtr_lan-addr} static ipx network**

Example: **show 5:1 static ipx network**

```
> show 5:1 static ipx network
SLOT 5:
Static IPX Network Settings for Axxius50:
    Total: 0
```

{rtr_lan-addr}

The Router address is in the form {slot:port} or {slot "profile-name"}.

slot	The slot number (1-8) that contains the Router card.
port	Port number of the Router.
"profile-name"	The profile name for the TSR interface. Name must be enclosed in quotes, with a maximum length of 11 characters.

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show (router-lan) static mac address

The **show (router-lan) static mac address** command displays the current list of static MAC address entries for the LAN on the specified Router card.

Syntax: **`show {rtr_lan-addr} static mac address`**

Example: **`show 5:1 static mac address`**

```
SLOT 5:
Static MAC Address Settings for Adit50:

    Device Name    MAC Address
    Axxius 66        00:E0:97:00:E9:CD
    Total: 1
```

{tsr_lan-addr}

The Router address is in the form {slot:port} or {slot "profile-name"}.

slot	The slot number (1-8) that contains the Router card.
port	Port number of the Router.
"profile-name"	The profile name for the Router interface. Name must be enclosed in quotes, with a maximum length of 11 characters.

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show (router-lan) stp

The show **(router-lan) stp** command displays the current Spanning Tree Protocol settings for the specified LAN interface.

Syntax: **show {rtr_lan-addr} stp**

Example: **show 3:1 stp**

```
> show 3:1 stp
SLOT 3:
LAN Spanning Tree Protocol Settings for LocalUnit:
    Spanning Tree:            Enabled
    Port Cost:               100   seconds
    Port Priority:           128   seconds
```

{rtr_lan-addr}

The Router address is in the form {slot:port} or {slot "profile-name"}.

slot	The slot number (1-8) that contains the Router card.
port	Port number of the Router.
"profile-name"	The profile name for the Router interface. Name must be enclosed in quotes, with a maximum length of 11 characters.

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show (router-wan)

The **show (router-wan)** command displays the current configuration settings for the specified WAN interface.

Syntax: **show {rtr_card-addr} {"wan-name"}**

Example: **show 3 "RemoteUnit"**

```
> show 3 "RemoteUnit"
SLOT 3:
Settings for TSR WAN LosAngeles:
    State:                    Enabled
    IP Settings:
        Mode:                 Route
        WAN Network Updates: Never
        GRE Tunneling:        Disabled

    IPX Settings:
        Mode:                 Blocked

    Other Settings:
        Mode:                 Blocked

    NAT Gateway:              Disabled
    WAN Numbered IP:          No

WAN PPP Authentication/Security Settings for RemoteUnit:
    Authentication of Remote User:
        User ID:              Remote Profile Name: RemoteUnit
        Security Server:      Local

    Compression:              Disabled
        Typical Data:         Easy to Compress

PPP Statistics for Slot-3:

                      Up/Down      Rx          Rx          Tx          Tx
Remote Name  State    Time       Packets     Octets      Packets     Octets
RemoteUnit    DOWN   38m30s        0           0           0           0

WAN Trunk Setting for RemoteUnit:
    No Trunk Assigned
```


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```
WAN Spanning Tree Protocol Settings for RemoteUnit:
    Spanning Tree:           Disabled

WAN Static IP Network Settings for RemoteUnit:
    Total: 0

WAN Static IPX Network Settings for RemoteUnit:
    Total: 0

WAN Static IP Address Settings for RemoteUnit:
    Total: 0

WAN Static MAC Address Settings for RemoteUnit:
    Total: 0

WAN Static NAT Address Settings for RemoteUnit:
    Total: 0

WAN Firewall Settings for RemoteUnit:

        Service(s)   LAN Device(s)          WAN Device(s)     Lo
    1.   Telnet       100.2.3.4/32   <==     *                 Log
  Last ! Any             *             <== ==> *
```

{rtr_card-addr}

The slot number (1-8) that contains the Router card.

{"wan-name"}

An existing WAN interface to modify. The name must be enclosed in quotes.

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show (router-wan) firewall

The **show (router-wan) firewall** command displays the current firewall filter settings for the specified WAN interface.

Syntax: **show {rtr_card-addr} {"wan-name"} firewall**

Example: **show 5 "LosAngeles" firewall**

```
> show 5 "LosAngeles" firewall
SLOT 5:
WAN Firewall Settings for LosAngeles:

   Service(s)      LAN Device(s)         WAN Device(s)         Log
1. SMTP           192.0.0.0/8       ==> 192.0.0.0/8          Log
2. Telnet         100.0.0.0/24      ==> 200.0.0.0/24         Alm
Last ! Any        *              <== ==> *
```

{rtr_card-addr} - The slot number (1-8) that contains the Router card.

{"wan-name"} - The WAN interface to modify. The name must be enclosed in quotes.

show (router-wan) nat bypass

Use the **show (router-wan) nat bypass** command to see the current list of NAT bypass entries for the WAN interface on the specified Router card.

Syntax: **show {rtr_card-addr} {"wan-name"} nat bypass**

Example: **show 2 "RemoteUnit" nat bypass**

```
SLOT 2:
WAN NAT Bypass Address Settings for RemoteAdit:

    IP Address          Netmask
    156.65.0.0          255.255.255.0
    201.23.16.0         255.255.255.0
    Total: 2
```

{rtr_card-addr} - The slot number (1-8) that contains the Router card.

{"wan-name"} - The WAN interface to modify. The name must be enclosed in quotes.

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show (router-wan) ppp

The **show (router-wan) ppp** command displays the current PPP (Point-to-Point Protocol) settings for the specified WAN interface.

Syntax: **show {rtr_card-addr} {"wan-name"} ppp**

Example: **show 5 "LosAngeles" ppp**

```
> show 5 "LosAngeles" ppp
SLOT 5:
WAN PPP Authentication/Security Settings for LosAngeles:
    Authentication of Remote User:
        User ID:              Remote Profile Name: LosAngeles
        Security Server:      Local
    Compression:              Disabled
        Typical Data:         Easy to Compress
PPP Statistics for Slot-4:

                     Up/Down     Rx         Rx         Tx          Tx
Remote Name  State Time       Packets   Octets    Packets    Octets
------------ ----- --------- ---------- --------- ---------- ---
RemoteAxxius   DOWN  26m36s        0         0          0          0
```

{rtr_card-addr}

The slot number (1-8) that contains the Router card.

{"wan-name"}

The WAN interface to modify. The name must be enclosed in quotes.

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show (router-wan) static ip address

The **show (router-wan) static ip address** command displays the current list of static IP address entries for the specified WAN interface.

Syntax: **show {rtr_card-addr} {"wan-name"} static ip address**

Example: **show 5 "LosAngeles" static ip address**

```
> show 5 "LosAngeles" static ip address
SLOT 5:
WAN Static IP Address Settings for LosAngeles:
    Total: 0
```

{rtr_card-addr}

The slot number (1-8) that contains the Router card.

{"wan-name"}

The WAN interface to modify. The name must be enclosed in quotes.

show (router-wan) static ip network

The **show (router-wan) static ip network** command displays the current list of static IP network entries for the specified WAN interface.

Syntax: **show {rtr_card-addr} {"wan-name"} static ip network**

Example: **show 5 "LosAngeles" static ip network**

```
> show 5 "LosAngeles" static ip network
SLOT 5:
WAN Static IP Network Settings for LosAngeles:

  Network          Subnet Mask      Metric   Remote Tunnel Addr
  200.1.1.0          255.255.255.0     1
  Total: 1
```

{rtr_card-addr}

The slot number (1-8) that contains the Router card.

{"wan-name"}

The WAN interface to modify. The name must be enclosed in quotes.

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show (router-wan) static ipx network

The **show (router-wan) static ipx network** command displays the current list of static IPX network entries for the specified WAN interface.

Syntax: **show {rtr_card-addr} {"wan-name"} static ipx network**

Example: **show 5 "LosAngeles" static ipx network**

```
SLOT 5:
WAN Static IPX Network Settings for LosAngeles:

    Network     Hops    Ticks    Next IPX Router
    00000011    2       4        00:00:00:00:00:00
   Total: 1
```

{rtr_card-addr}

The slot number (1-8) that contains the Router card.

{"wan-name"}

The WAN interface to modify. The name must be enclosed in quotes.

show (router-wan) static mac address

The **show (router-wan) static mac address** command displays the current list of static IP MAC address entries for the specified WAN interface.

Syntax: **show {rtr_card-addr} {"wan-name"} static mac address**

Example: **show 5 "LosAngeles" static mac address**

```
SLOT 5:
WAN Static MAC Address Settings for LosAngeles:

    Device Name    MAC Address
    Axxius32         00:E0:97:00:E9:CD
    Total: 1
```

{rtr_card-addr}

The slot number (1-8) that contains the Router card.

{"wan-name"}

The WAN interface to modify. The name must be enclosed in quotes.

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show (router-wan) static nat address

The **show (router-wan) static nat address** command displays the current static NAT address entries for the specified WAN interface.

Syntax: **show {rtr_card-addr} {"wan-name"} static nat address**

Example: **show 5 "LosAngeles" static nat address**

```
> show 5 "RemoteUnit" static nat address
SLOT 5:
WAN Static NAT Address Settings for RemoteUnit:
    Total: 0
```

{rtr_card-addr}

The slot number (1-8) that contains the Router card.

{"wan-name"}

The WAN interface to modify. The name must be enclosed in quotes.

show (router-wan) stp

The **show (router-wan) stp** command displays the current Spanning Tree Protocol settings for the specified WAN interface.

Syntax: **show {rtr_card-addr} {"wan-name"} stp**

Example: **show 5 "LosAngeles" stp**

```
> show 5 "LosAngeles" stp
SLOT 5:
WAN Spanning Tree Protocol Settings for LosAngeles:
    Spanning Tree:           Enabled
    Port Cost:               651   seconds
   Port Priority:          128  seconds
```

{rtr_card-addr}

The slot number (1-8) that contains the Router card.

{"wan-name"}

The WAN interface to modify. The name must be enclosed in quotes.

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show (router-wan) trunk

The **show (router-wan) trunk** command displays the current trunk assignment for the specified WAN interface.

Syntax: **show {rtr_card-addr} {"wan-name"} trunk**

Example: **show 5 "LosAngeles" trunk**

```
> show 5 "LosAngeles" trunk
SLOT 5:
WAN Trunk Setting for LosAngeles:
        WAN Port Number:     1
        Connection Type:     PPP
```

{rtr_card-addr}

The slot number (1-8) that contains the Router card.

{"wan-name"}

The WAN interface to modify. The name must be enclosed in quotes.

show screen

The **show screen** command displays the screen settings.

Example: **show screen**

```
Screen Height = 23
```


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show snmp

The **show snmp** command displays the SNMP settings.

Example: **show snmp**

```
SNMP Settings:
  System Name:
  System Location:
  System Contact:
  GET Community:            public
  SET Community:            desktop
  TRAP Community:           public
  Trap version:             0
  Authentication TRAP       disabled
  Event TRAP                none
  NMS 1:
  NMS 2:
  NMS 3:
```

show syslog

The **show syslog** command displays settings for the system log.

Syntax: **show syslog**

Example: **show syslog**

```
Syslog Settings:
  Syslog:  Disabled
  Server   IP Address         Facility   Threshold Level
  1        0.0.0.0            16         3
  2        0.0.0.0            16         3
  3        0.0.0.0            16         3
```


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show time

The **show time** command displays the system time, in 24 hour hh:mm:ss format.

Syntax: **show time**

Example: **show time**

```
> show time
time:  00:22:51
```

show users

The **show users** command displays a list of all users and their settings, and if they are logged on at the time (0=not logged on, 1=logged on).

Syntax: **show users**

Example: **> show users**

```
  User        Level    Last Login          Logged In
  ----        -----    ----------          ---------
* jack          1      00:00:13 01/01/1999      1


* indicates self
```


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show (v35)

Use the **show (v35)** to display current settings for V.35 card.

Syntax: **`show {v35-addr}`**

Example: **`show 2:1`**

The example shows settings for port 1 (V.35) on slot 2.

```
> show 2:1
SLOT 2:
Settings for V35 Port 1:
     CTS:                    Always High
     Timing:                 Source
     Rx Clock Inversion:     Normal
     Tx Clock Inversion:     Normal
     Data Inversion:         Normal
     Data Speed:             64K
     Data Rate:
     Loopback:               None
```

{v35-addr}

In the form {slot|slot:port}.

slot	slot (1-8) location of a V.35 card.
port	Port number or range.

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show (v54)

Use the **show (v54)** to display current settings for V.54 card.

Syntax: **`show {v54-addr}`**

Example: **`show 3:1`**

The example shows settings for port 1 (V.54) on slot 3.

```
> show 3
SLOT 3:
Settings for V35 Port 1:
     CTS:                    Always High
     Timing:                 Source
     Rx Clock Inversion:     Normal
     Tx Clock Inversion:     Normal
     Data Inversion:         Normal
     Data Speed:             64K
     Data Rate:
     V.54 Rx LB:             disabled
     V.54 Rx Addr:           0
     V.54 Test Addr:         0
     V.54 Tx Prep count:     15
     V.54 Rx Prep count:     15
     V.54 Test Pattern:      QRSS
     V.54 Ignore ACK:        OFF
     Loopback:               None
```

{v54-addr}

In the form {slot|slot:port}.

slot	slot (1-8) location of a V.35/54 card.
port	Port number or range.

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status

Use the **status** command to see the status of the system clocks, DS0s, DS1s, equipment, and the DS0 Management Channel.

status (adpcm)
status (adpcm) performance
status (adpcm) performance history
status (bri)
status (bri) performance
status (bri) performance history
status clock
status (ds0)
status (ds1)
status (ds1) performance
status (ds3) performance history
status (ds3)
status (ds3) performance
status (ds3) performance history
status equipment
status (fxo)
status (fxsPS or fxsPSM)
status ipds0
status lsprotect
status (ocudp)
status (ocudp) performance
status (ocudp) performance history
status (router)
status (router-lan)
status (router-trunk)
status sessions
status (v54)

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status (adpcm)

Use the **status (adpcm)** command to display the status information for the ADPCM card.

Syntax: **`status {adpcm-addr}`**

Example: **`status 6:1`**

```
> status 6:1
SLOT 6:
Status for DS1  1:
    Receive:                Loss of Signal
    Transmit:               RAI/Yellow Alarm
    Loopback:               OFF
```

{adpcm-addr}

The ADPCM address is in the form {slot|slot:port}. Where {slot} displays information for all ports on the card, {slot:port} for only the defined port.

slot	Slot number (1-8) where the ADPCM card is located
port	Port number. range 1-4. If no port is entered all ports will be displayed.

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status (adpcm) performance

Use the **status (adpcm) performance** command to display the performance statistics for the current (15 min) and previous (15 min, hour and day) information for the ADPCM card.

Syntax: **`status {adpcm-addr} performance`**

Example: **`status 6:1 performance`**

```
> status 6:1 performance
SLOT 6:
Performance Statistics for DS1  1:

                                    current                previous
                                15 min.   15 min.    1 hour     1 day
unavailable seconds:                69       900      3600      7200
severely errored seconds:            0         0         0         0
errored seconds:                     0         0         0         0
sev. errored frame seconds:          0         0         0         0
line errored seconds:                0         0         0         0
controlled slip seconds:             0         0         0         0
bursty errored seconds:              0         0         0         0

degraded minutes:                    0         0         0         0
total linecode violations:           0         0         0         0
total pathcode violations:           0         0         0         0

elapsed time in current 15 min. interval:  1:09
valid 15 min. intervals in hour:              4
valid 15 min. intervals in Day:               8
* - indicates threshold has been crossed.
```

{adpcm-addr}

The ADPCM address is in the form {slot:port}.

slot	Slot number (1-8) where the ADPCM card is located
port	Port number, range or all.

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status (adpcm) performance history

Use the **status (adpcm) performance history** command to display performance statistics for the current 15 minute interval and all previous 15 minute intervals (up to a total of 96) for the ADPCM card.

Syntax: **status {adpcm-addr} performance history**

Example: **status 6:1 performance history**

```
> status 6:1 performance history
SLOT 6:
Performance Statistics for DS1  1:

                UAS  SES   ES SEFS  LES  CSS  BES   DM     LCV      PCV
curr. interval:  317    0    0    0    0    0    0    0       0        0
prev. intvl  1:  900    0    0    0    0    0    0    0       0        0
prev. intvl  2:  900    0    0    0    0    0    0    0       0        0
prev. intvl  3:  900    0    0    0    0    0    0    0       0        0
prev. intvl  4:  900    0    0    0    0    0    0    0       0        0
.
.
.
prev. intvl 93:  900    0    0    0    0    0    0    0       0        0
prev. intvl 94:  900    0    0    0    0    0    0    0       0        0
prev. intvl 95:  900    0    0    0    0    0    0    0       0        0
prev. intvl 96:  900    0    0    0    0    0    0    0       0        0
totals:       21181    0    0    0    0    0    0    0       0        0

elapsed time in current 15 min. interval:  5:17
valid 15 min. intervals in data:             96
```

{adpcm-addr}

The ADPCM address is in the form {slot:port}.

slot	Slot number (1-8) where the ADPCM card is located
port	Port number, range or all.

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status (bri)

Use the **status (bri)** command to display the status information for the ISDN BRI card.

Syntax: **`status {bri-addr}`**

Example: **`status 3:1`**

The example displays status of port 1 (BRI) on slot 3.

```
> status 3:1
SLOT 3:
Status for BRI Port 1:
    Loopback:                NONE
    Corrupt CRC:             NONE
```

{bri-addr}

The BRI address, in the form {slot:port}.

slot	The slot number (1-8) that contains the BRI card
port	Port number, range or all

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status (bri) performance

Use the **status (bri) performance** command to display the performance statistics for the current (hour and day) and previous (hour and day) for the ISDN BRI card.

Syntax: **`status {bri-addr} performance`**

Example: **`status 3:1 performance`**

```
> status 3:1 performance
SLOT 3:
Performance Statistics for BRI Port 1:

                          current  previous  current  previous
                          1 hour    1 hour      day       day
errored seconds:               0         0        0         0
severely errored seconds:      0         0        0         0
block errors:                  0         0

elapsed time in current 1-hour interval: 00:38:00
completed 1-hour intervals in data:             0
```

{bri-addr}

The BRI address, in the form {slot:port}.

slot	The slot number (1-8) that contains the BRI card
port	Port number, range or all

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status (bri) performance history

Use the **status (bri) performance history** command to display the performance statistics for the current 1 hour interval and all previous 1 hour intervals for the ISDN BRI card.

Syntax: **`status {bri-addr} performance history`**

Example: **`status 5:1 performance history`**

```
SLOT 5:
Performance Statistics for BRI Port 1:
                          HES     HSES       BE      DES     DSES
current interval            0        0        0        0        0
prev. interval 1            0        0        0        0        0
prev. interval 2            0
totals:                     0        0        0        0        0

elapsed time in current 1-hour interval: 00:37:38
completed 1-hour intervals in data:             2
```

{bri-addr}

The BRI address, in the form {slot:port}.

slot	The slot number (1-8) that contains the BRI card
port	Port number, range or all

status clock

Use the **status clock** command to display the current status of the primary and secondary clocks.

Syntax: **`status clock`**

Example: **`status clock`**

```
Active Clock Source: Secondary

Primary:
  Clock Source:      Slot A DS1 1
  Clock Status:      Out of Service
Secondary:
  Clock Source:      Internal
  Clock Status:      In Service
```


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status (ds0)

Use the **status (ds0)** command to display the current status of the specified DS0.

Syntax: **`status {ds0-addr}`**

Example: **`status a:1:1`**
Displays the current status of the DS0s on port 1 on slot A (controller card), port 1, channel 1.

```
> status a:1:1

DS0          Rx AB    Tx AB    Signal    T1          TP
A:1:1         11       01       EMW      Traffic     N
```

Display Descriptions

Rx AB - AB bits received by the FXS or FXO port

Tx AB - AB bits transmitted by the FXS or FXO port

Signal - Signaling mode for which the port is configured

T1 - T1 Status

TP - Trunk Processing

{ds0-addr}

The Controller DS0 addresses are different on the DS3 and DS1 Controller, however the DS0 address on the service cards does not change with Controller type (DS3 or DS1).

DS0 Address on a DS3 Controller in the form {slot:port:channel:sub-channel}		
	slot	A for the DS3 Controller card.
	port	Port number, range or all.
	ds1 channel	DS1 channel number, range or all.
	ds0 channel	DS0 channel number, range or all.
DS0 Address on a DS1 Controller or service cards (with DS1 or DS3 controller) in the form {slot:port:channel}		
	slot	A for the DS1 Controller card, or 1-8 for service cards.
	port	Port number, range or all.
	channel	Channel number, range or all.

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status (ds1)

Use the **status (ds1)** command to display the current status of a DS1.

Syntax: **`status {ds1-addr} [performance] [history]`**

Example: **`status a:1`**

```
SLOT A:
Status for DS1  1:
    Receive:                Traffic
    Transmit:               Traffic
    Loopback:               OFF
```

Example: **`status 1:1`**

```
SLOT A:
Status for DS1  1:
    Receive:                Loss of Signal
    Transmit:               AIS
    Loopback:               OFF
```

{ds1-addr}

The Controller DS1 addresses are different on the DS3 and DS1 Controller, however the DS1 address on the services cards does not change with Controller type (DS3 or DS1).

DS1 Address on a DS3 Controller in the form {slot:port:channel}		
	slot	A for the DS3 Controller card.
	port	Port number, range or all.
	channel	Channel number, range or all.
DS1 Address on a DS1 Controller or service cards (with DS1 or DS3 controller) in the form {slot:port}		
	slot	A for the DS1 Controller card (DS1 mode), or 1-8 for service cards.
	port	Port number, range or all.

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status (ds1) performance

Use the **status (ds1) performance** command to display the performance statistics for the current (15 min) and previous (15 min, hour and day) information of a DS1.

Syntax: **`status {ds1-addr} performance`**

Example: **`status a:1 performance`**

```
SLOT A:
Performance Statistics for DS1  1:

                                    current              previous
                                 15 min.   15 min.     1 hour      1 day
unavailable seconds:                89        900        2700       2700
severely errored seconds:            0          0           0          0
errored seconds:                     0          0           0          0
sev. errored frame seconds:          0          0           0          0
line errored seconds:                0          0           0          0
controlled slip seconds:             0          0           0          0
bursty errored seconds:              0          0           0          0

degraded minutes:                    0          0           0          0
total linecode violations:           0          0           0          0
total pathcode violations:           0          0           0          0

elapsed time in current 15 min. interval:  1:29
valid 15 min. intervals in hour:              3
valid 15 min. intervals in Day:               3
* - indicates threshold has been crossed.
```

{ds1-addr}

The Controller DS1 addresses are different on the DS3 and DS1 Controller, however the DS1 address on the services cards does not change with Controller type (DS3 or DS1).

DS1 Address on a DS3 Controller in the form {slot:port:channel}

	slot	A for the DS3 Controller card.
	port	Port number, range or all.
	channel	Channel number, range or all.

DS1 Address on a DS1 Controller or service cards (with DS1 or DS3 controller) in the form {slot:port}

	slot	A for the DS1 Controller card (DS1 mode), or 1-8 for service cards.
	port	Port number, range or all.

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status (ds1) performance history

Use the **status (ds1) performance history** command to display performance statistics for the current 15 minute interval and all previous 15 minute intervals (up to a total of 96) of a DS1.

Syntax: **`status {ds1-addr} performance history`**

Example: **`status a:1 performance history`**

```
SLOT A:
Performance Statistics for DS1  1:

                UAS  SES   ES SEFS  LES  CSS  BES   DM      LCV      PCV
curr. interval:  288    0    0    0    0    0    0    0        0        0
prev. intvl  1:  900    0    0    0    0    0    0    0        0        0
prev. intvl  2:  900    0    0    0    0    0    0    0        0        0
prev. intvl  3:  900    0    0    0    0    0    0    0        0        0
prev. intvl  4:  900    0    0    0    0    0    0    0        0        0

totals:         3888    0    0    0    0    0    0    0        0        0

elapsed time in current 15 min. interval:  4:48
valid 15 min. intervals in data:              4
```

{ds1-addr}

The Controller DS1 addresses are different on the DS3 and DS1 Controller, however the DS1 address on the services cards does not change with Controller type (DS3 or DS1).

DS1 Address on a DS3 Controller in the form {slot:port:channel}		
	slot	A for the DS3 Controller card.
	port	Port number, range or all.
	channel	Channel number, range or all.
DS1 Address on a DS1 Controller or service cards (with DS1 or DS3 controller) in the form {slot:port}		
	slot	A for the DS1 Controller card (DS1 mode), or 1-8 for service cards.
	port	Port number, range or all.

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status (ds3)

Use the **status (ds3)** command to display the current status of the specified DS3.

Syntax: **`status {ds3-addr}`**

Example: **`status a:1`**

```
> status a:1
SLOT A:
Status for DS3  1  DS1  1:

Status for DS3  1:
    Receive:                Loss of Framing
    Transmit:               Traffic
    Loopback:               OFF
```

{ds3-addr}

In the form of {slot port}:

slot	A, with a DS3 controller card installed.
port	Port number or range. Range of ports is 1-2

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status (ds3) performance

Use the **status (ds3) performance** command to display the performance statistics for the current (15 min) and previous (15 min, hour and day) information of a DS3.

Syntax: **status {ds3-addr} performance**

```
> status a:1 performance
SLOT A:
Performance Statistics for DS3 Port 1:
Near End Statistics:
                            current  previous
                          15 min.    15 min.     1 hour      1 day
unavailable seconds:            0          0          0          0
sev. errored frame seconds:     0          0          0          0
sev. errored c-bit seconds:     0          0          0          0
errored c-bit seconds:          0          0          0          0
sev. errored p-bit seconds:     0          0          0          0
p-bit errored seconds:          0          0          0          0
line errored seconds:           0          0          0          0

total linecode violations:      0          0          0          0
total pathcode violations:      0          0          0          0
total cbitcode violations:      0          0          0          0

Far End Statistics:
unavailable seconds:                0          0          0
sev. errored c-bit seconds:         0          0          0
errored c-bit seconds:              0          0          0
total cbitcode violations:          0          0          0

elapsed time in current 15 min. interval:  4:24
valid 15 min. intervals in hour:              3
valid 15 min. intervals in Day:               3
* - indicates threshold has been crossed.
```

{ds3-addr}

In the form of {slot port}:

slot	A, with a DS3 controller card installed.
port	Port number or range. Range of ports is 1-2

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status (ds3) performance history

Use the **status (ds3) performance history** command to display performance statistics for the current 15 minute interval and all previous 15 minute intervals (up to a total of 96) of a DS1.

Syntax: **status {ds3-addr} performance**

```
> status a:1 performance history
SLOT A:
Performance Statistics for DS3 Port 1:

Near End Statistics:
                  UAS  SEFS  CSES   CES  PSES   PES   LES   LCV     PCV
curr. interval:     0     0     0     0     0     0     0     0       0

totals:             0     0     0     0     0     0     0     0       0


Far End Statistics:
                  UAS  CSES   CES   CCV
curr. interval:     0     0     0    0

totals:             0     0     0    0

elapsed time in current 15 min. interval:  7:27
valid 15 min. intervals in data:              0
```

{ds3-addr}

In the form of {slot port}:

slot	A, with a DS3 controller card installed.
port	Port number or range. Range of ports is 1-2

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status equipment

Use the **status equipment** command to display current equipment information of the Axxius 800.

Syntax: **status equipment [slot]**

Example: **status equipment**

```
Axxius> status equipment

          CardType    Status         SW Vers     CLEI
SLOT P1   +24 V       Healthy                    SIPUMR0DAA
SLOT P2   Card not installed

SLOT A1   T3x2        Active          2.1.0      SIIX60FDAA
SLOT A2   T3x2        Hot Standby     2.1.0      SIIX60FDAA

SLOT B1   Card not installed
SLOT B2   Card not installed

SLOT 1    TSRx4       Present          1.03      SIC380XCAA
SLOT 2    T1x4        Not Present
SLOT 3    V35x2       Present          2.01      SIC3HK0CAA
SLOT 4    V35x2       Present          2.01      SIC3HK0CAA
SLOT 5    BRIx8       Present          1.11      SIIXUX0DAA
SLOT 6    OCUDPx1     Present          1.01      SIIXA4DDAA
SLOT 7    FXOx8       Present          1.12      SIIXPV0DAA
SLOT 8    FXSPSMx1    Present          0.01
```

Example: **status equipment a2**

```
Axxius> status equipment a2
SLOT A2:

Product:             Axxius 800
Card Type:           Controller with T3x2 Services
Status:              Active
Card Revision:       A.00
BootCode Revision:   1.6
SW Revision:         2.1.0 (build: 6)
CLEI:                SIIX60FDAA
```


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Example: **`status equipment 3`**

The example with display the status of the card in slot 4. In this example a TSR card is in this slot.

```
> status equipment 3
SLOT 3

CardType:           TSRx4
Status:             Present
SW Revision:        1.30H
BootCode Version:   2.22
FPGA Revision:      1.01
CLEI:               SIL1UW0EAA
```

[slot]

If a slot number is not entered, the status of the all slots will be displayed.

slot	A for the controller card, or 1-8 for service cards.

status (fxo)

Use the **status (fxo)** to display the current near-end line status of the specified FXO.

Syntax: **`status {fxo-addr}`**

Example: **`status 5:2`**

The example displays status of port 2 (FXO) on slot 5.

```
> status 5:2

FXO    Rx AB  Tx AB  Signal=>T1 sig  T1                 TP
---    -----  -----  --------------  -----------------  --
5:2     01     10      GS=>GS         Traffic            N
```

See *Display Descriptions on page 5-231* for definitions of column headings.

{fxo-addr}

slot	The slot number (1-8) that contains the FXO card
port	Port number or range.

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status (fxsPS or fxsPSM)

Use the **status (fxsPS or FXS PSM)** to display the current near-end line status of the specified FXS PS or FXS PS card with modem.

Syntax: **`status {fxsPS-addr|fxsPSM-addr}`**

Example: **`status 4:1`**
The example displays status of port 1 (FXS PS) on slot 4.

```
> status 4:1

FXS     Rx AB   Tx AB   Signal=>T1 Sig   T1                  TP
---     -----   -----   --------------   -----------------   --
4:1       01      01       LS => LS      Traffic             N
```

{fxsPS-addr|fxsPSM-addr}

In the form {slot|slot:port}, since there is only one port the system will display the same information with either address.

slot	Slot number (1-8) of the FXS PS or FXS PSM card
port	Port number or range.

status ipds0

Use the **status ipds0** command to display the current status of the DS0 management channel.

Syntax: **`status ipds0`**

Example: **`status ipds0`**

```
> status ipds0
Operational state:     DOWN
```


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status lsprotect

Use the **status lsprotect** command to display the current status of the low speed protection cards.

Syntax: **status lsprotect**

Example: **status lsprotect**

```
> status lsprotect

                          Low Speed Protection Status:

Low Speed Protection Global Service Enable: ENABLED
   Low Speed Protection Operational Status: ENABLED
                 Relay Card Status, Slot 9: INSTALLED

               Backup Slot: 7
          Backup Slot Type: Quad T1

  Backup Slot Port Status:

PORT: LOS: LCV: XMIT: PRES:
  1    NO   NO  NORM  PRES
  2    NO   NO  NORM  PRES
  3    NO   NO  NORM  PRES
  4    NO   NO  NORM  PRES

                           Protected Port Status:

SLOT: PORT: TYPE: BACKUP: ENABLED: SWITCHMODE:  LOCKOUT: LOS: LCV: XMIT:
PRES:
  3     1    QT1    NO       NO       MANUAL      N/A     YES  NO  NORM  PRES
  3     2    QT1    NO       NO       MANUAL      N/A     YES  NO  NORM  PRES
  3     3    QT1    NO       NO       MANUAL      N/A     YES  NO  NORM  PRES
  3     4    QT1    NO       NO       MANUAL      N/A     YES  NO  NORM  PRES
  5     1    QT1    NO       NO       MANUAL      N/A     YES  NO  NORM  PRES
  6     1    QT1    NO       NO       MANUAL    CNT=  2   YES  NO  NORM  PRES
  6     2    QT1    NO       NO       MANUAL    CNT=  2   YES  NO  NORM  PRES
  6     3    QT1    NO       NO       MANUAL    CNT=  2   YES  NO  NORM  PRES
  6     4    QT1    NO       NO       MANUAL    CNT=  2   YES  NO  NORM  PRES

Number of Protected Ports: 9
```


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status (ocudp)

Use the **status (ocudp)** command to displaystatus for selftest and loopbacks.

Syntax: **`status {ocudp-addr}`**

Example: **`status 2:1`**

```
SLOT 2:
Status for OCUDP Port 1:
    Selftest:
 Results as of 23:25:48  01/07/2001
    Datapath:                    PASS
    FPGA:                        PASS
    OCU:                         PASS

    OCU Manual Loopback:         NONE
    CSU Manual Loopback:         NONE

    OCU NonLatching Loopback:    NONE
    DSU NonLatching Loopback:    NONE
    CSU NonLatching Loopback:    NONE

    OCU Latching Loopback:       NONE
    DSU Latching Loopback:       NONE
    CSU Latching Loopback:       NONE
```

{ocudp-addr}

The {slot:port} address of the OCU-DP card to display.

slot	Slot number (1-8) where the OCU-DP is located
port	Port number or range.

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status (ocudp) performance

Use the **status (ocudp) performance** command to display performance statistics for the current 15 minute interval, previous 15 minute interval, previous 1 hour interval, and for the previous day.

Syntax: **`status {ocudp-addr} performance`**

Example: **`status 2:1 performance`**

```
> status 2:1 performance
SLOT 2:
Performance Statistics for OCUDP Port 1:

                                  current              previous
                              15 min.    15 min.      1 hour       1 day
                          ----------- ----------- ----------- ----------
out of service seconds:         775           0           0           0
loss of frame seconds:            0           0           0           0
loss of signal seconds:         784           0           0           0
bipolar violations seconds:       0           0           0           0

elapsed time in current 15 min. interval: 13:27
valid 15 min. intervals in hour:                0
valid 15 min. intervals in Day:                 0
```

{ocudp-addr}

The {slot:port} address of the OCU-DP card to display.

slot	Slot number (1-8) where the OCU-DP is located
port	Port number or range.

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status (ocudp) performance history

Use the **status (ocudp) performance history** command to display performance statistics for the current 15 minute interval and all previous 15 minute intervals (up to a total of 96).

Syntax: **`status {ocudp-addr} performance history`**

Example: **`status 2:1 performance history`**

```
> status 2:1 performance history
SLOT 2:
Performance Statistics for OCUDP Port 1:

                   OOS     BPV     LOF     LOS
                 -----   -----   -----   -----
curr. interval:    248       0       0     248
prev. intvl  1:    899       0       0     900
prev. intvl  2:    886       0       0     896
                 =====   =====   =====   =====
totals:           2033       0       0    2044

elapsed time in current 15 min. interval:  4:14
valid 15 min. intervals in data:              2
```

{ocudp-addr}

The OCUDP address is in the form {slot|slot:port}. Where {slot} displays information for all ports on the card, {slot:port} for only the defined port.

slot	Slot number (1-8) where the ADPCM card is located
port	Port number, range or all.

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status (router)

status (router) alarms

Use the **status (router) alarms** command to display the current alarm log from the specified TSR card.

Syntax: **status {tsr_card-addr} alarms**

Example: **status 5 alarms**

```
                ROUTER BLADE ALARM LOG REPORT Slot-5
Time                 Message                        Count

Jan  4 22:26:47.0 Ethernet Link 5:1 Down.
```

{tsr_card-addr}

The slot number (1-8) that contains the TSR card.

status (router) dns

Use the **status (router) dns** command to display the current state of DNS resolver and the entries in the DNS cache.

Syntax: **status {tsr_card-addr} dns**

Example: **status 4 dns**

```
> status 4 dns

            ROUTER BLADE DNS RESOLVER REPORT Slot-4
 DNS RESOLVER IS ENABLED

 My DNS Ip Address  10.  0.  0.  1
 My DNS Hostname   Axxius25.test

 Primary   DNS Server  10. 10. 10.  0
 Secondary DNS Server   0.  0.  0.  0
```

{tsr_card-addr}

The slot number (1-8) that contains the TSR card.

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status (router) events

Use the **status (router) events** command to display the current event log from the specified Router card.

Syntax: **`status {rtr_card-addr} events`**

Example: **`status 5 events`**

```
> status 5 events

          ROUTER BLADE EVENTS LOG REPORT Slot-5

Time             Message                                    Count

Jan 10  0:56:44.8 Download EVE.RPT by Controller
Jan 10  0:54:27.4 Download complete in 0.0 secs [17440 bps]
Jan 10  0:54:27.4 Download ALM.RPT by Controller
Jan 10  0:14:23.5 ADMIN login terminated
Jan 10  0:14:21.8 Download complete in 0.1 secs [61600 bps]
Jan 10  0:14:21.7 Download config.cfg by Controller
Jan 10  0:14:21.6 Send CFG Change Notice to Controller - PASS
Jan 10  0:14:20.7 NVRAM Flash Task Wakeup Event Sent
Jan 10  0:10:56.5 Login accepted at ADMIN level
Jan 10  0:03:29.9 ADMIN login terminated
Jan 10  0:03:28.5 Download complete in 0.1 secs [60880 bps]
Jan 10  0:03:28.4 Download config.cfg by Controller
Jan 10  0:03:28.3 Send CFG Change Notice to Controller - PASS
Jan 10  0:03:27.4 NVRAM Flash Task Wakeup Event Sent
Jan 10  0:02:48.7 Login accepted at ADMIN level
Jan  9 23:29:34.5 Download complete in 0.1 secs [60160 bps]
Jan  9 23:29:34.3 Download config.cfg by Controller
Jan  9 23:29:34.3 Send CFG Change Notice to Controller - PASS
Jan  9 23:29:33.4 NVRAM Flash Task Wakeup Event Sent
Jan  9 23:28:35.7 Download complete in 0.1 secs [60000 bps]
Jan 9 23:28:35.5 Download config.cfg by Controller
```

{rtr_card-addr}

The slot number (1-8) that contains the Router card.

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status (router) ip address table

Use the **status (router) ip address table** command to display the current IP address table for the specified TSR card.

Syntax: **status {tsr_card-addr} ip address table ["profile-name"]**

Example: **status 5 ip address table**

```
>   status 5 ip address table

          ROUTER BLADE IP ADDRESSES REPORT Slot-5

Axxius50 has learned 2 IP Addresses from 1 Port.
 Display: <IP Address >   Learned From: <All Ports   >

     Port Name               IP Address       MAC Address

  1. Local LAN     Static    120.0.0.10
  2. Local LAN     Direct    192.168.3.196    00E09701E574
```

Example: **status 5 ip address table "Axxius50"**

```
> status 5 ip address table "Axxius50"

          ROUTER BLADE IP ADDRESSES REPORT Slot-5

Axxius50 has learned 2 IP Addresses
 Display: <IP Address >   Learned From: <Local LAN >

                  IP Address       MAC Address

  1.    Static    120.0.0.10
  2.    Direct    192.168.3.196    00E09701E574
```

{rtr_card-addr}

The slot number (1-8) that contains the Router card.

["profile-name"]

The profile name for the TSR interface that is used to reach this destination. Name must be enclosed in quotes, with a maximum length of 11 characters.

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status (router) ip network table

Use the **status (router) ip network table** command to display the current table of learned IP Networks for the specified interface on the Router card.

Syntax: **status {rtr_card-addr} ip network table ["profile-name"]**

Example: **status 5 ip network table**

```
> status 5 ip network table
          ROUTER BLADE IP NETWORKS REPORT Slot-5
Total Entries-3 on 2 Ports
Display: <IP Networks >  Learned From: <All Ports   >

            Network         Subnet Mask     Metric Next Gateway    Port Name
   1. Static 200.1.1.0       255.255.255.0   1                    LosAngeles
   2. Static 100.0.0.0       255.0.0.0       1      192.136.43.52   Local LAN
   3. Direct 192.168.3.0     255.255.255.0   1      192.168.3.196   Local LAN
```

Example: **status 5 ip network table "Axxius50"**

```
   > status 5 ip network table "Axxius50"
          ROUTER BLADE IP NETWORKS REPORT Slot-5
Total Entries-2 on Local LAN
Display: <IP Networks >  Learned From: <Local LAN >

             Network          Subnet Mask     Metric Next Gateway    Frame
   1. Static 100.0.0.0        255.0.0.0       1      192.136.43.52   Eth II
   2. Direct 192.168.3.0     255.255.255.0   1      192.168.3.196   Eth II
```

{rtr_card-addr}

The slot number (1-8) that contains the Router card.

["profile-name"]

The profile name for the Router interface that is used to reach this destination. Name must be enclosed in quotes, with a maximum length of 11 characters.

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status (router) ipx network table

Use the **status (router) ipx network table** command to display the current table of learned IPX Networks for the specified interface on the Router card.

Syntax: **status {rtr_card-addr} ipx network table ["profile-name"]**

Example: **status 5 ipx network table**

```
> status 5 ipx network table
          ROUTER BLADE IPX NETWORKS REPORT Slot-5
Total Entries-4 on 1 Ports
Display: <IPX Networks>  Learned From: <All Ports    >

        Network  Hops Ticks  Next IPX Router    Port Name   Frame Type
  1. Static 00000011 2     4                       LosAngeles   802.3
  2. Static 00000011 2     4                       LosAngeles   802.2
  3. Static 00000011 2     4                        LosAngeles   SNAP
  4. Static 00000011 2     4                      LosAngeles   Eth II
```

Example: **status 5 ipx network table "Axxius50"**

```
> status 5 ipx network table "Axxius50"
          ROUTER BLADE IPX NETWORKS REPORT Slot-5
Total Entries-0 on Local LAN
Display: <IPX Networks>  Learned From: <Local LAN >

             Network  Hops Ticks  Next IPX Router    Frame Type
 No Records to Display...
```

{rtr_card-addr}

The slot number (1-8) that contains the Router card.

["profile-name"]

The profile name for the Router interface that is used to reach this destination. Name must be enclosed in quotes, with a maximum length of 11 characters.

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status (router) ipx server table

Use the **status (router) ipx server table** command to display the current table of learned IPX Servers for the specified interface on the Router card.

Syntax: **status {rtr_card-addr} ipx server table ["profile-name"]**

Example: **status 4 ipx server table**

```
> status 4 ipx server table

          ROUTER BLADE IPX SERVERS REPORT Slot-4

Total Entries-0 on 0 Ports
Display: <IPX Servers >  Learned From: <All Ports   >

     Network   Hops Type Name        Port Name   Frame Type

 No Records to Display...
```

Example: **status 5 ipx server table "Axxius50"**

```
> status 5 ipx server table "Axxius50"
          ROUTER BLADE IPX SERVERS REPORT Slot-5

Total Entries-0 on Local LAN
Display: <IPX Servers >  Learned From: <Local LAN >

     Network   Hops Type Name        Frame Type

 No Records to Display...
```

{rtr_card-addr}

The slot number (1-8) that contains the Router card.

["profile-name"]

The profile name for the Router interface that is used to reach this destination. Name must be enclosed in quotes, with a maximum length of 11 characters.

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status (router) mac address table

Use the **status (router) mac address table** command to display the current table of learned MAC Addresses for the specified interface on the Router card.

Syntax: **status {rtr_card-addr} mac address table ["profile-name"]**

Example: **status 5 mac address table**

```
> status 5 mac address table
          ROUTER BLADE MAC ADDRESSES REPORT Slot-5

Axxius50 has learned 2 MAC Addresses from 1 Port.
 Display: <MAC Address>   Learned From: <All Ports   >

     Port Name            MAC Address
  1. Local LAN     Direct 00E09701E574
  2. Local LAN     Static 00E09700E9CD
```

Example: **status 5 mac address table "Axxius50"**

```
> status 5 mac address table "Axxius50"
          ROUTER BLADE MAC ADDRESSES REPORT Slot-5

Axxius50 has learned 2 MAC Addresses
 Display: <MAC Address>   Learned From: <Local LAN >

              MAC Address
  1.    Direct 00E09701E574
  2.    Static 00E09700E9CD
```

{rtr_card-addr}

The slot number (1-8) that contains the Router card.

["profile-name"]

The profile name for the Router interface that is used to reach this destination. Name must be enclosed in quotes, with a maximum length of 11 characters.

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status (router) performance

Use the **status (router) performance** command to display the current runtime statistics from the specified Router card.

Syntax: **status {rtr_card-addr} performance**

Example: **status 5 performance**

```
           ROUTER BLADE PERFORMANCE REPORT Slot-5
Run-time Statistics for Axxius50.

LAN Packet Totals:  Received 0       Transmitted 0       Errors 0
WAN Packet Totals:  Received 0       Transmitted 0       Errors 0

 Remote's       Forwarded     Throughput      Comp. Ratio  Remote
 Name            to WAN      to/from WAN     to/from WAN  conns.
 LosAngeles         0  pps      0 /0     bps       /          0
```

{rtr_card-addr}

The slot number (1-8) that contains the Router card.

status (router) stp

Use the **status (router) stp** command to display the current Spanning Tree state from the specified Router card.

Syntax: **status {rtr_card-addr} stp**

Example: **status 5 stp**

```
           ROUTER BLADE SPANNING TREE PROTOCOL REPORT Slot-5
 STP Stats

No Enabled STP Ports Detected.

 STP View

 Bridge Priority: 32768 Address:00E09701E574
 Root Priority: 32768 Address:00E09701E574
 Root Port: 0  Path Cost 0
```

{rtr_card-addr}

The slot number (1-8) that contains the Router card.

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status (router-lan)

Use the **status (router-lan)** command to display the current Router status information.

Syntax: **`status {rtr_lan-addr)`**

Example: **`status 3:1`**

The example displays status of the Router card in slot 3.

```
> status 3:1
SLOT 3:
Status for TSR Card
    Run Status:              Running

    PORT 1      RS-232
TELNET:             UP
TRANSMIT:          YES
RECEIVE:           YES

    PORT 2      RS-232
TELNET:             UP
TRANSMIT:          YES
RECEIVE:           YES

    PORT 3      RS-232
TELNET:             UP
TRANSMIT:          YES
RECEIVE:           YES

    PORT 4      RS-232
TELNET:             UP
TRANSMIT:          YES
RECEIVE:           YES
```

{rtr_lan-addr}

The Router address is in the form {slot:port|slot "profile-name"}.

slot	The slot number (1-8) that contains the Router card.
port	Port number, or all.
profile-name	Existing LAN identifier, enclosed in quotes.

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status (router-trunk)

Use the **status (router-trunk)** command to display the current status information for the specified Trunk on the Router card.

Syntax: **`status {rtr_trunk-addr)`**

Example: **`status 3:1:1-4`**

```
> status 3:1:1-4
SLOT 3:
Status for TSR 1 Trunk 1:
    Link Alarm:              NO
SLOT 3:
Status for TSR 1 Trunk 2:
    Link Alarm:              NO
SLOT 3:
Status for TSR 1 Trunk 3:
    Link Alarm:              NO
SLOT 3:
Status for TSR 1 Trunk 4:
    Link Alarm:              NO
```

{rtr_trunk-addr}

The Router trunk address is in the form {slot:port:trunk}.

slot	The slot number (1-8) that contains the Router card.
port	Port number of the Router.
trunk	Trunk number, a range or "all" can be used here. Port numbers are 1-24.

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status sessions

Use the **status sessions** command to display the current status of all active CLI sessions.

Syntax: **status sessions**

Example: **status sessions**

```
> status sessions

  Session    User          Login Port
  -------    ----          ----------
* TELNET1     paul          192.168.1.1

* indicates current session
```


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status (v54)

Use the **status (v54)** to display the current near-end line status of the V.54 card.

Syntax: **`status {v54-addr}`**

Example: **`status 3:all`**

The example displays status of all ports (V.54) on slot 3.

```
> status 3:all
SLOT 3:
Status for V35  PORT 1:
      DCD:   Low
      CTS:   Low
      DSR:   Low
      RTS:   Low
      DTR:   Low
     BERT:   N/A
SLOT 3:
Status for V35  PORT 2:
      DCD:   Low
      CTS:   Low
      DSR:   Low
      RTS:   Low
      DTR:   Low
     BERT:   N/A
```

{v54-addr}

slot	The slot number (1-8) that contains the V.54 card
port	Port number or range.

Display Descriptions

DCD - Data Carrier Detect indicates port is receiving a carrier signal

CTS - Clear to Send indicates port is ready to receive data

DSR - Data Set Ready indicates port is ready to send data

RTS - Request to Send

DTR - Data Terminal Ready

BERT - Bit Error Rate Test

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store

The **store** command is used to upload a software file from a defined slot to a defined location on a PC, via TFTP. Currently uploads for general use are only permitted for the Controller and TSR card configuration files.

Syntax: **store {number} tftp {ip-addr} {"file-name"}**

Example: **store 5 tftp 192.168.2.35 "d:\AxxiusBackup\file.cfg"**

```
Filename:  d:\AxxiusBackup\file.cfg
Source IP Address:  198.162.3.196
Target IP Address:  192.168.43.52
Source Card Slot:   5
Source Card Type:   tsrx1

'store tftp' will be executed with the above parameters.
A TFTP server must be running on the host system.

Do you really want to do this? y

Card software download in progress. Please be patient...

Software transfer command completed.
```

{number}

Slot number (1 to 8) that you are uploading the software from.

{ip-addr}

Host IP address in the form of xxx.xxx.xxx.xxx, where xxx is a number from 1 to 255. If not supplied, the host IP address from the database will be used.

{"file-name"}

This will name the configuration file that you are storing. File must be a .cfg file and enclosed in quotes.

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switch

switch activeimage

Use the **switch activeimage** command to switch the active with the backup application images stored in a Controller or Router card.

Syntax: **`switch [rtr_card-addr] activeimage`**

Example: **`switch activeimage`**

```
> switch activeimage
 Do you really want to do this? y
OK
```

[rtr_card-addr] - The Router card slot number (1 - 8) to retrieve the image information from. Note: If no slot number is entered, the image information is retrieved from the Controller.

switch controller

Use the **switch controller** command to switch to the standby controller.

Note: for redundant Axxius systems only.

Syntax: **`switch controller`**

Example: **`switch controller`**

```
> switch controller

 Do you really want to do this? y

Standby controller not found.  Switch Command Canceled!
```


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switch (ds3)

Use the **switch (ds3)** command to switch to the standby DS3 port.

Note: for redundant Axxius systems only.

Syntax: **`switch {ds3-addr}`**

Example: **`switch a:1`**

```
> switch a:1

 Do you really want to do this? y
OK
```

{ds3-addr}

In the form of {slot port}:

slot	A for the controller card
port	Port number (1 or 2).

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telnet

telnet (router)

Use the **telnet (router)** command to establish a Telnet session from the Axxius 800 CLI to the Router card menu-driven user interface.

Syntax: **`telnet {rtr_lan-addr}`**

Example: **`telnet 3`**

The example will Telnet into a TSR in Slot 3.

```
> telnet 3
Connected.
          Escape character is '^]'.
Attempting Carrier Access Router connection...
Router [Wed Apr 24, 2002 13:00:15] (<CR> to login)
Password >******
Select a terminal type...
(<space> or <back-space> to toggle, <CR> to accept)

Terminal: <VT100>
```

{rtr_lan-addr}

The Router address is in the form {slot:port|slot "profile-name"}}.

slot	The slot number (1-8) that contains the Router card.
port	Port number of the Router.
profile-name	Existing WAN identifier, enclosed in quotes.

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trace route

tracert (router)

Use the **tracert (router)** command to invoke a Trace Route to a host device on a network of a particular TSR Router. Trace Route responses will be returned to user screen as each hop host device response packet is received or the timeout return data is provided for a hop. The output will have DNS names only if DNS resolver is enabled and DNS server can resolve host IP. The optional parameters [ttlbeg] and [ttlmax] allot the user to define the range of hops the trace route will query. An response with an * indicates no response from the host.

Syntax: **tracert {rtr_card-addr} {ip-addr|"domain-name"} [type] [src-ip] [ttlbeg] [ttlmax] [udp-port]**

Example: **tracert 2 10.40.15.70 udp**

Example: **tracert 3 ""www.google.com" ICMP 192.168.100.100 1 32**

```
Tracert 3 www.google.com 192.168.100.100 5 32 in progress…
  Hops  Ave.   Host
  1    <10 ms  99.90.9.254 nat1xt-tw-gw.carrieraccess.com
  2    <10 ms  65.243.6.17
  3     10 ms  137.39.6.200
  4     20 ms  152.63.101.134 0.so-3-1-0.XL2.DFW9.ALTER.NET
  5     20 ms  152.63.102.6 0.so-0-0-0.XR2.DFW9.ALTER.NET
  6     10 ms  152.63.100.221 184.ATM7-0.BR4.DFW9.ALTER.NET
  7     *      *
  8     10 ms  208.172.130.104 agr4-loopback.Dallas.cw.net
  9     10 ms  208.172.139.9 dcr1-so-0-2-0.Dallas.cw.net
 10    580 ms  216.33.153.188 csr1-ve241.SantaClarasc3.cw.net
 11     60 ms  64.68.64.210
this.is.an.device.name.2.long.2show.all.of.name...
 12     70 ms  216.239.47.2
 13     60 ms  216.239.33.101 www.google.com
Trace Terminated: 13 Hops, Hop range 1-13
```

{rtr_card-addr}

The slot number (1-8) that contains the Router card.

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{ip-addr|"domain-name"}

ip-addr	The IP address for trace route to use for this query, in the form of xxx.xxx.xxx.xxx, where xxx is between 0-255.
domain-name	The domain name for the external DNS server. Name must be enclosed in quotes, with a maximum length of 42 characters.

[type]

icmp	Internet Control Message Protocol (ICMP) method of trace routing is the most widely used and has the best reliability. This is the default.
udp	User Datagram Protocol (UDP) method requires that all devices in the chain of the trace route support probes on the particular UDP port. This method is not recommended.

[src-ip]

This optional parameter, only applies it [type] is set to ICMP. This defines the source IP address in the ICMP echo request and must be one of the router interface IP addresses. Default is to use the IP address of the interface from which the ping is sent.

[ttlbeg]

This optional parameter allows the user to define the beginning (or the minimum) of the range of hops the trace route will query. Range is 1 - [ttlmax] value. Default is 1.

[ttlmax]

This optional parameter allows the user to define the end (or the maximum) of the range of hops the trace route will query. Range is [ttlbeg] - 255 value. Default is 30.

[udp-port]

This optional parameter only applies if [type] is set to UDP. Range is 1 - 65535, with a default of 33434.

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CHAPTER 6

DS1 Controller Card

In this Chapter

- Overview
- Features
- Technical Specifications
- Configuration
- Built-In Card Handles
- LEDs

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Overview

The Quad port DS1 Controller card drives the Axxius 800 Access Integration Platform, delivering a cost-effective, compact solution enabling wireless service providers to optimize cell site access facilities, rescue up to 35% of stranded cell sit bandwidth and deliver additional revenue generating services at dramatically lower costs.

The DS1 Controller card features 4 DS1 ports with integrated CSUs and a built-in 1/0 cross-connect matrix. This provides full, non-blocking connectivity between the Controller and any of the 8 Service card slots. The Controller connects to the control panel unit for physical termination of the on-board DS1 circuits, as well as access to the RS-232 and Ethernet management interfaces.

The DS1 Controller card manages all the other Axxius Service cards providing the physical, electrical and logical connections to deliver a complete wireless cell site solution.

The DS1 Controller card has several local and remote management options available. Front-panel LEDs quickly communicate alarm, system and line status. The card can be configured and managed locally through the RS-232 or Ethernet management connections on the Control Panel using a Command Line Interface (CLI).

A number of remote management options are available to reduce truck roll costs for most maintenance and troubleshooting activities. The in-band DS0 management channel on the Controller delivers 64 Kbps remote access to the Axxius without incurring additional facility costs. Alternatively, a separate Ethernet facility can be deployed to support out-of-band SNMP network management and the Controller can also be accessed through the V.34 dial-in modem connection from the Order Wire POTS with Modem Service card.

NOTE: Removing an active Controller is not recommended, use the *switch controller* command to change the Active Controller to Standby and then remove the Controller card.

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Features

- Rescues up to 35% or more of network bandwidth commonly wasted at the cell site or when providing fractional T1 service
- Provides full, non-blocking DS0 cross-connect connectivity between the DS1 Controller card and any of the eight service card slots
- Supports up to 36 T1 ports
- Performs framing and coding conversion between T1 ports
- Features an integrated 1/0 digital cross-connect for service grooming and provisioning
- Four DS1 ports built into the Controller terminate multiple network connections and support drop-and-insert applications
- Software selectable DS1 or DSX interfaces
- Enables remote SNMP, or Telnet provisioning, performance monitoring, and testing of services and network conditions

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Technical Specifications

Product Includes

- Built-in non-blocking 1/0 Digital Cross-connect System for up to 36 T1 ports
- Robbed-bit (voice) and clear channel (data) signaling on the same DS1
- Integral quad T1 ports that support drop-and-insert applications
- T1.231 performance monitoring statistics: 96 15-minute segments (24 hour period)
- Performance report messages
- Front-panel LED indicators for DS1 status, major and minor alarms, and alarm cut-off status are located on the Control Panel Interface card
- Controller support for Terminal Server Router card code download through its Ethernet management port
- Configurations automatically stored in non-volatile memory
- SNMP agent, supporting MIB objects:
  - RFC 1213 (MIB-II)
  - RFC 1659 (V.35)
  - RFC 1907 (SNMPv2-MIB)
  - RFC 2011 (IP-MIB)
  - RFC 2233 (IF-MIB)
  - RFC 2494 (DS0-MIB)
  - RFC 2495 (DS1/E1-MIB)

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Management

- Local
  - RS-232 craft port interface drives up to 50 ft. (15.24 m) cable, and provides a Command Line Interface (CLI) using ASCII terminal or PC with terminal emulation software, modem using XMODEM or PPP sessions
- Remote
  - 10/100Base-TX Ethernet management port provides
    - Local IP management connectivity
    - RJ-45 connector
    - 10/100Base-TX Ethernet link LED status indicator
    - IP management over a dedicated DS0 bearer channel
  - CLI management via the V.34 modem port on the Single Channel POTS with Modem Service card
- Integrated TFTP client for remote download of Controller software upgrades
- SNMP agent for use with SNMP-based Element Management Systems
- CLI offers three levels of password controlled security

DS1 Interface

- Selectable four DS1 ports from the Connector Panel operating at 1.544 Mbps ± 50 bps
- 4 DS1 ports operating at 1.544 Mbps
- Expansion to 36 DS1 ports in a single chassis using Quad DS1 Service Cards
- SF (D4) and ESF framing, AMI or B8ZS line coding (DS1 operation)
- Short-haul or long-haul loop settings for DS1
- 4 RJ-48C connectors located on the front of the Control Panel Interface Card
- Integrates DS1 CSU functionality for direct connection to DS1 lines
- Offers secondary solid-state fuseless protection to lightning and power cross incidents.

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Service Interfaces Supported

- Dual V.35/.54 Service card (hardened)
- FXO Voice Service card
- ISDN BRI Service card
- OCU-DP Service card
- Quad DS1 ADPCM Service card (hardened)
- Quad T1 Service card (hardened)
- Single Channel POTS Service card (hardened)
- Single Channel POTS with Modem Service card
- Terminal Server Router (TSR) card (hardened)

Network Standards

- AT&T Pub 54016, TR 62411
- ANSI T1-403, T1.102, T1.231
- ITU G.703, G.704
- TBR 12 and 13

Clocking

- Loop-timed from any DS1
- External from BITS clock input (T1.101, T1.102 signal type)
- Revertive or non-revertive (provisionable) clock switching provides automatic backup to secondary DS1 should the primary DS1 fail
- Operates as a Stratum 4E device as defined by Telcordia GR-1244-CORE and AT&T TR 62411

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Alarms

- Three visible alarm outputs, critical, major and minor
- Three audible alarm outputs, critical, major and minor
- Alarm Cut-Off for audible alarm outputs
- Ten external alarm inputs (user definable)
- Alarm contacts accessible from external alarm connector
- All alarms are logged in an event log
- Loss of power triggers minor alarm
- Generates SNMP traps for alarming (MIB objects)

Testing and Diagnostics

- Standard T1 line and payload loopbacks
- Local loopback
- T1.231 performance history

Power Consumption

- 6 W maximum

Environment

In addition to the systems environment requirements, the following applies to the DS1 Controller card. For additional information see *Installation Environment" on page 2-3.*

- Operating temperature range of the DS1 Controller card: -40° to 149° F (-40° to 65° C)

Physical

- Dimensions: 3.5 in. (H) x 0.75 in. (W) x 11.25 in. (D)
  8.9 cm (H) x 1.9 cm (W) x 28.6 cm (D)
- Weight: 10.2 oz. (0.29 kg)

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Controller Active and Standby

The Axxius 800 can function fully with a single Controller card, however Controller redundancy is available with two like Controllers (DS1 or DS3) installed. When two Controllers are installed in a system, one is always Active and the other is Standby. The Standby can have 2 conditions:

- Hot Standby - meaning that the card is ready to take over for the active and the switch will not affect service
- Cold Standby - meaning that the card is ready to go active (healthy) but for some reason (code of the 2 controllers is not the same) it will need to reconfigure the box when it goes active, which will be service affecting.

There are two ways to identify the status of the Controllers.

1. CLI Command *status equipment*

```
> status equipment

          CardType    Status         SW Vers     CLEI
SLOT P1   +24 V       Healthy                    SIPUMR0DAA
SLOT P2   Card not installed
SLOT A1   T1x4        Active          1.1.0      SIIX4W0DAA
SLOT A2   T1x4        Hot Standby     1.1.0      SIIX4W0DAA
SLOT B1   Card not installed
SLOT B2   Card not installed
SLOT 1    TSRx4       Present          1.00       NOT AVAIL
SLOT 2    T1x4        Present          1.73      SIIXFWBDAA
SLOT 3    V35x2       Present          2.01      SIC3HK0CAA
SLOT 4    V35x2       Present          2.01      SIC3HK0CAA
SLOT 5    BRIx8       Present          1.11      SIIXUX0DAA
SLOT 6    OCUDPx1     Present          1.01      SIIXA4DDAA
SLOT 7    FXOx8       Present          1.12      SIIXPV0DAA
SLOT 8    FXSPSMx1    Present          0.01
SLOT 9    Card not installed
```

2. Visually looking at the Controller cards.
   Active - STAT LED will be solid green.
   Hot Standby - STAT LED will be solid yellow
   Cold Standby - STAT LED will be flashing yellow

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Configuration

Options on the Quad DS1 Controller card are set by the Command Line Interface (CLI). Note: the faceplate state DS1/E1 Controller, the E1 feature is not supported on this release.

CLI Commands

The following commands are used to configure the Quad DS1 Controller card. For detailed information on these commands, see *Chapter 5, CLI Commands*.

- *connect*
  Creates two-way connections between channels
- *disconnect*
  Removes a connection created by the connect command
- *set clock (1 and 2)*
  Sets the primary and secondary transmit clock
- *set date*
  Sets the date for the system
- *set (ds1)*
  Sets up the DS1 interfaces (up, down, BP violation, FDL, framing, ID string, line build out, line loopup, linecode, loopdetect, payload, threshold)
- *set ipds0*
  Sets up the DS0 management channel (assign, disable, down, IP address, up)
- *show (ds1)*
  Displays current settings for DS1 (circuit ID, up, down, framing, line coding, clock source, line build out, loop code detection, loop back, FDL type)
- *show ipds0*
  Displays the settings for the DS0 management channel
- *status (ds1)*
  Displays the status of the DS1 (receive, transmit, loopback)
- *status ipds0*
  Display the status of the DS0 management channel

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Built-In Card Handles

The Controller card is designed with a handle built into the faceplate to assist in the removal of the card from the chassis. This handle slides out away from the unit, creating a handle for a more effective grip.

LEDs

The DS1 Controller has a set of six LEDs. The table below describes each LED.

LED	State	Description
STAT	Green	Active
	Red	Failed
	Flashing Red	System Reset
	Yellow	Hot Standby
	Flashing Yellow	Cold Standby
	Alternating Red/Yellow	Application Loading
LINE STAT (1-4)	Off	Port Shutdown
	Green	Good Line
	Slow Blink Green	Loopback
	Red	LOS
	Slow Blink Red	LOF, AIS
	Fast Blink Red	Card Failure
	Yellow	Code Violation
	Slow Blink Yellow	RAI

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CHAPTER 7

DS3 Controller Card

In this Chapter

- Overview
- Features
- Technical Specifications
- Configuration
- Built-In Card Handles
- LEDs

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Overview

The Dual port DS3 Controller card drives the Axxius 800 Access Integration Platform, delivering a cost-effective, compact solution enabling wireless service providers to optimize cell site access facilities, rescue up to 35% of stranded cell sit bandwidth and deliver additional revenue generating services at dramatically lower costs.

The DS3 Controller card features 2 DS3 ports with integrated 3/1/0 cross-connect matrix. This provides full, non-blocking connectivity between the DS3 Controller and any of the 8 Service card slots, enabling the Axxius to operate as both a service delivery platform at the cell site and as a small M13 multiplexer delivering T1/FT1 tributaries to remote cell site locations. The DS3 Controller connects to the control panel unit for physical termination of the on-board DS3 circuits, as well as access to the RS-232 and Ethernet management interfaces.

The DS3 Controller card manages all the other Axxius Service cards providing the physical, electrical and logical connections to deliver a complete wireless cell site solution.

The DS3 Controller card has several local and remote management options available. Front-panel LEDs quickly communicate alarm, system and DS3 line status. The card can be configured and managed locally through the RS-232 or Ethernet management connections on the Control Panel using a Command Line Interface (CLI).

A number of remote management options are available to reduce truck roll costs for most maintenance and troubleshooting activities. The in-band DS0 management channel on the Controller delivers 64 Kbps remote access to the Axxius without incurring additional facility costs. Alternatively, a separate Ethernet facility can be deployed to support out-of-band SNMP network management and the Controller can also be accessed through the V.34 dial-in modem connection from the Order Wire POTS with Modem Service card. Remote configuration, monitoring, maintenance and troubleshooting tasks are further simplified from the central Network Operation Center (NOC) using the graphical interfaces of the NetworkValet.

NOTE: Removing an active Controller is not recommended, use the *switch controller* command to change the Active Controller to Standby and then remove the Controller card.

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Features

- 2 DS3 ports built into the Controller deliver bandwidth to the resident cell site for service delivery applications and distribute residual bandwidth to remote cell sites
- Rescues up to 35% of network bandwidth commonly stranded at the cell sites
- Provides full, non-blocking connectivity between the DS3 Controller card and any of the 8 service card slots
- Features an integrated 3/1/0 digital cross-connect for service grooming and restoration
- Enables remote SNMP, EMS or Telnet provisioning, monitoring and testing of services and network conditions.

Technical Specifications

Product Includes

- Built-in non-blocking 3/1/0 Digital Cross-connect System
- Robbed-bit (voice) and clear channel (data) signaling on the same DS3
- Integral dual DS3 ports that support drop-and-insert applications
- RFC 2496 performance monitoring statistics: Ninety-six 15 minute segments (24 hour period)
- Performance Report Messages
- Front-panel LED indicators for DS3 system and line status
- Controller support for Terminal Server Router card code download through its Ethernet management port
- Configurations automatically stored in non-volatile memory
- SNMP agent, supporting MIB objects:
  - RFC 1213 (MIB-II)
  - RFC 1659 (V.35)
  - RFC 1907 (SNMPv2-MIB)
  - RFC 2011 (IP-MIB)
  - RFC 2233 (IF-MIB)
  - RFC 2494 (DS0-MIB)
  - RFC 2496 (DS3-MIB)

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Management

- Local
  - RS-232 craft port interface drives up to 50 ft. (15.24 m) cable, and provides a Command Line Interface (CLI) using ASCII terminal or PC with terminal emulation software, modem using XMODEM or PPP sessions
- Remote
  - 10/100Base-TX Ethernet management port provides
    - Local IP management connectivity
    - RJ-45 connector
    - 10/100Base-TX link LED status indicator
    - IP management over a dedicated DS0 bearer channel
  - CLI management via the V.34 modem port on the Order Wire Single Channel POTS with Modem Service card
  - GUI management from NetworkValet EMS
- Integrated TFTP client for remote download of controller software upgrades
- SNMP agent for use with NetworkValet
- CLI offers three levels of password controlled security

Network DS3 Interface

- Line Rate: 44.746 Mbps ± 20 ppm
- Line Code: B3ZS Bipolar with three zero substitution
- Framing format: M23 and C-bit parity
- Transmit impedance: 75 Ω ± 5%, unbalanced
- Transmit jitter attenuation: Meets ANSI T1.102 requirements
- Transmit amplitude: Meets ANSI T1.102 pulse mask with 0.36 to 0.85 Vp requirements
- Transmit length (cable): 500 ft. (152.4 m) to crossconnect
- Receive sensitivity: -10 dB w/r DSX-3 120 mVp to 900 mVp input range with automatic gain control circuit

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Service Interfaces Supported

- Dual V.35/.54 Service card (hardened)
- FXO Voice Service card
- ISDN BRI Service card
- OCU-DP Service card
- Quad DS1 ADPCM Service card (hardened)
- Quad T1 Service card (hardened)
- Single Channel POTS Service card (hardened)
- Single Channel POTS with Modem Service card
- Terminal Server Router (TSR) card (hardened)

Network Standards

- ANSI T1-403 and T1.404

Clocking

- Loop-timed from any DS1 within the DS3
- External BITS clock
- Revertive or non-revertive (provisionable) clock switching provides automatic backup to secondary DS3 should the primary DS3 fail
- Operates as a Stratum 4E device as defined by Telcordia GR-1244-CORE and AT&T TR 62411

Alarms

- Three visible alarm outputs, critical, major and minor
- Three audible alarm outputs, critical, major and minor
- Alarm Cut-Off for audible alarm outputs
- Ten alarm inputs
- Alarm contacts accessible from external alarm connector
- All alarms are logged in an event log
- Loss of power triggers minor alarm
- Generates SNMP traps for alarming (MIB objects)

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Testing and Diagnostics

- Supports maintenance signals specified in ANSI T1.404 (Section 7.1)
- Standard DS3 line and payload loopbacks
- RFC 2496 performance history

Power Consumption

- 10 W maximum

Environment

In addition to the systems environment requirements, the following applies to the DS3 Controller card. For additional information see Installation Environment on page 2-3.

- Operating temperature range of the DS3 Controller card: -40° to 149° F (-40° to 65° C)

Physical

- Dimensions: 3.5 in. (H) x 0.75 in. (W) x 11.25 in. (D)
  8.9 cm (H) x 1.9 cm (W) x 28.6 cm (D)
- Weight: 10.2 oz. (0.29 kg)

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Controller Active and Standby

The Axxius 800 can function fully with a single Controller card, however Controller redundancy is available with two like Controllers (DS1 or DS3) installed. When two Controllers are installed in a system, one is always Active and the other is Standby. The Standby can have 2 conditions:

- Hot Standby - meaning that the card is ready to take over for the active and the switch will not affect service
- Cold Standby - meaning that the card is ready to go active (healthy) but for some reason (code of the 2 controllers is not the same) it will need to reconfigure the box when it goes active, which will be service affecting.

There are two ways to identify the status of the Controllers.

1. CLI Command *status equipment*

```
> status equipment

          CardType    Status         SW Vers     CLEI
SLOT P1   +24 V       Healthy                    SIPUMR0DAA
SLOT P2   Card not installed
SLOT A1   T3x4        Active          1.1.0      SIIX4W0DAA
SLOT A2   T3x4        Hot Standby     1.1.0      SIIX4W0DAA
SLOT B1   Card not installed
SLOT B2   Card not installed
SLOT 1    TSRx4       Present         1.00        NOT AVAIL
SLOT 2    T1x4        Present         1.73       SIIXFWBDAA
SLOT 3    V35x2       Present         2.01       SIC3HK0CAA
SLOT 4    V35x2       Present         2.01       SIC3HK0CAA
SLOT 5    BRIx8       Present         1.11       SIIXUX0DAA
SLOT 6    OCUDPx1     Present         1.01       SIIXA4DDAA
SLOT 7    FXOx8       Present         1.12       SIIXPV0DAA
SLOT 8    FXSPSMx1    Present         0.01
SLOT 9    Card not installed
```

2. Visually looking at the Controller cards.
   Active - STAT LED will be solid green.
   Hot Standby - STAT LED will be solid yellow
   Cold Standby - STAT LED will be flashing yellow

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Controller and DS3 Redundancy

Protection Modes

The Axxius 800 can be provisioned with one or two DS3 Controller cards and connections to one or two DS3 lines, which will provide the following levels of protection:

- **Electronics Protection** – when provisioned with two Controller cards and only one DS3 line, only the Controller cards can be protected
- **Network Protection** – when provisioned with one Controller and two independent DS3 lines, only the DS3 lines can be protected.
- **Electronics and Network Protection** – when provisioned with two Controller cards and two independent DS3 lines, both the controller cards and the DS3 lines can be protected

Electronics Protection Mode

In this mode there are two DS3 Controllers installed the Axxius 800, but only one DS3 line connected.

The electronics mode of protection provides Controller card redundancy. Because there is only one DS3 connected, there is no DS3 redundancy. The receive path from the DS3 line is simultaneously applied to the receiver of both Controller cards (see Figure). This enables both controllers to monitor the condition of the DS3 line so both are continuously framed up to the incoming signal. The Controller-select signal disables the outputs of the low-speed receive paths on the standby Controller and enables the low-speed receive paths on the active controller. The active Controller's transmit signal is connected to the transmit path of the DS3 line through a relay, while the standby is disconnected until a protection switch occurs.

The automatic redundancy mode is used to enable and disable protection switching. If the redundancy control process determines the active controller is malfunctioning, or a maintenance switch is invoked (the *switch* command), a protection switch will occur. This means that the active Controller relinquishes control to the secondary Controller. This is done by enabling the standby Controller's receive path and disabling the originally active Controller's low-speed receive path (Controller-select signal) and

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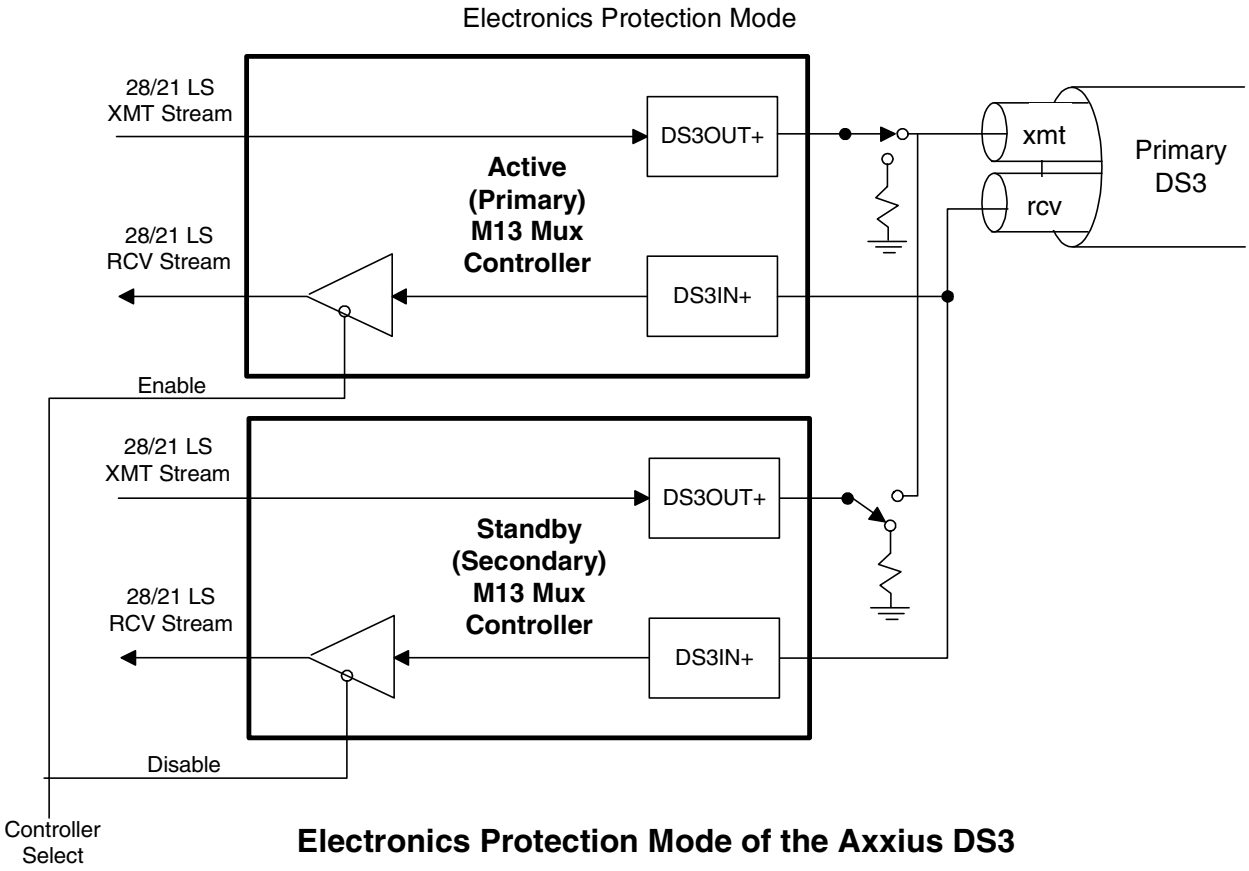
switching the output paths so that the transmit path of the DS3 line is connected to the standby Controller. Service interruptions (hits) will be taken on both the DS3 and low-speed connections during this type of switch. However, since the standby Controller is already framed up to the incoming signal, the hits are minimal.



Electronics Protection Mode of the Axxius DS3

The Axxius does not provide a non-revertive mode in electronic protection. No automatic switchback will occur (as with a revertive Network Protection), but if the currently active Controller malfunctions, etc. another protection switch will occur if the mate is in a standby mode.

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Network Protection Mode

The network mode of protection requires a single Controller with two independent DS3 channels. The cross connects are set up identically for both DS3s. Both revertive and non-revertive modes are applicable. Two DS3 framers are present on the DS3 Controller card. Both are framed to their respective incoming data. Backplane data is sent to both transmitters and is sent out both interfaces. On loss of signal or high bit error rate, software will switch from Primary to Secondary interface. In revertive mode, if the signal returns to the Primary interface or the BERT level is restored for a period of time, software will return control to the Primary interface. In non-revertive mode, return to the Primary interface would be by command only or if the secondary line fails and the primary has returned to normal operation.

Electronics and Network Protection Mode

The highest level of protection, electronics and network protection, allows both the Controller cards and the DS3 lines to be switched. This mode is available with two Controllers and two active DS3 lines. Network protection switching must be enabled and cross connects set up. In this mode, the primary Controller is connected to the both the primary DS3 line and the secondary DS3 lines (TX and RX). The low-speed transmit streams are multiplexed, framed and simultaneously broadcast on both the primary and secondary DS3 lines, thus transmitting the identical payload to the far-end service and protection line. Also, each Controller is framed up to both its DS3 lines and the Controller select signal determines which Controller has access to the low-speed cards, and thus carries the service.

If the active Controller malfunctions, if the DS3 line condition deteriorates, or a maintenance switch is invoked (the *switch* command), a protection switch will occur in the Axxius DS3, which enables the secondary DS3 path through the other Controller card. If revertive switching is enabled after a five minute delay (beginning when the previously-active controller's error rate equals zero) the Axxius DS3 will switch back to the previously-active Controller and DS3 line, if there is no longer a malfunction in that path during the five-minute delay. If revertive switching is not enabled no switch-back will occur.

NOTE: After a switching event in revertive mode, switching cannot occur again until the original Controller and DS3 line have experienced 5 minutes of error-free operation. The 5-minute delay is built-in, and conforms to standards to prevent oscillation during poor DS3 line conditions.

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Configuration

Options on the DS3 Controller card are set by the following CLI commands.

CLI Commands

The following commands are used to configure the DS3 Controller card. For detailed information on these commands, see *Chapter 5, CLI Commands*.

- *connect*
  Creates two-way connections between channels
- *disconnect*
  Removes a connection created by the connect command
- *set clock*
  Sets the signal clock switching
- *set clock (1 and 2)*
  Sets the primary and secondary transmit clock
- *set date*
  Sets the date for the system
- *set (ds3)*
  Sets up the DS3 interfaces (up, down, berthreshold, clock, dejitter, equipment, facility ID, frame, framing, generator number, ID, line loopup, location ID, loopdetect, payload, port number, protect, reversion, threshold, unit ID)
- *set ipds0*
  Sets up the DS0 management channel (assign, disable, down, IP address, up)
- *show (ds3)*
  Displays current settings for a DS3
- show ipds0
  Displays the settings for the DS0 management channel
- *status (ds3)*
  Displays the status of the DS3 (receive, transmit, loopback)
- *status ipds0*
  Display the status of the DS0 management channel

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Built-In Card Handles

The Controller card is designed with a handle built into the faceplate to assist in the removal of the card from the chassis. This handle slides out away from the unit, creating a handle for a more effective grip.

LEDs

The DS3 Controller has a set of six LEDs. The table below describes each LED.

LED	State	Description
STAT	Green	Active
	Red	Failed
	Flashing Red	System Reset
	Yellow	Hot Standby
	Flashing Yellow	Cold Standby
	Alternating Red/Yellow	Application Loading
LINE STAT (1-2) 3-4 are not used on this card	Off	NO transport or port shutdown
	Green	Good Line
	Slow Blink Green	Loopback
	Red	LOS
	Slow Blink Red	LOF, AIS
	Fast Blink Red	Card Failure
	Yellow	Standby, when path protection is active
	Slow Blink Yellow	RAI, IDLE, or if protection is active Out-of-Service

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CHAPTER 8

FXO Voice Card

In this Chapter

- Overview
- Features
- Technical Specifications
- Card Configuration
  - CLI Commands
  - DIP Switch Settings
- LEDs
- Channel Associated Signaling (CAS) Conversions

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Overview

The FXO Voice Service card provides high-density provisioning of reliable Foreign Exchange Office (FXO) or Direct Inward Dialing (DID) telephone services. Eight FXO or Dial Pulse Terminate (DPT) telephone line channels can be deployed on each FXO Service card. These cards can be inserted into any of the eight service card slots of the Axxius 800 Access Integration Platform. This allows the provisioning of up to 64 FXO or DPT lines in a single Axxius 800 chassis.

The FXO function sinks battery current and detects ringing voltage originating from the central office or PBX line, enabling the transport of dial tone and calling features to remote locations. When configured as a DPT interface, the channels sink and detect forward and reverse line current, emulating the functions of a central office DID line. DID service provides the necessary dialed digits to ring a telephone extension directly through a PBX, without requiring attendant intervention. DPT and FXO functions are also used with Automatic Call Distributor (ACD), voice mail, and Computer Telephony Integration (CTI) applications.

A unique range of software-controlled signaling capabilities connects virtually any type of 2-wire battery-sink telephone line service. Supported features include caller ID, calling party disconnect, distinctive ringing, ground start, and E&M signaling conversion. Automatic impedance balancing provides echo-free service connections across a wide range of customer equipment and line conditions. V.90 transmission ensures optimal dial-up modem performance.

As a component of the Axxius 800 platform, the FX0 Service card as several local and remote management options available through the Axxius 800 Controller. The card can be locally configured and managed using the Command Line Interface (CLI). Front-panel LEDs indicate call progress and channel status. Remote management is accomplished using the graphical configuration, management and maintenance interfaces available in future releases of the NetworkValet (EMS).

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Features

- Delivers FXO or DID telephone services from T1 access circuits
- Supports CLASS services including caller ID, calling party disconnect and distinctive ringing
- Provides up to 64 FXO or DPT voice lines in one Axxius 800 chassis, occupying just two rack units of equipment space (19 or 23- inch rack)
- Complies with NEBS Level 3 standards for loop range and ringing protection for end office and customer premises
- Offers fuseless overvoltage and overcurrent protection to minimize service calls from lightning and power cross incidents

Technical Specifications

Controller Software and Hardware Required

- Release 1.1 or higher is required for the FXO Service card
- -48V NI48V Power Supply (P/N 740-0084) is required for this card

FXO Transmission Performance

- Return Loss: ERL > 26 dB, SRL > 18 dB with respect to 900Ω + 2.16µF
- Transhybrid Loss: ERL > 26 dB, SRL > 18 dB with respect to 900Ω + 2.16µF
- Idle Noise: A/D < 16 dBrnC0, D/A, 12 dBrnC0
- Crosstalk Coupling: < 70 dB at 0 dBrn0
- Signal/Distortion: > 35 dB with 1004 Hz, 0 dBm0 input
- Overload: +3.0 dBm/900Ω
- Frequency Response: +0.3 dB -1.0 dB from 300 to 3400 Hz
- Encoding: µ-law 255 for U.S. and Canada as defined in CCITT G.711 and G.712
- Terminating Impedance: 900Ω + 2.16µF
- Transmit Gain/Loss: +7 to -9 dB, CLI selectable
- Receive Gain/Loss: +7 to -9 dB, CLI selectable
- Modem Support: Full compatibility with V.90 modems

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FXO Signaling Performance

- DC Loop Range: > 1600Ω loop or ground start
- Ringer Equivalency Number (REN): 0.4B (AC)
- Ringing Voltage Detection: detects Class A ringing follows distinctive ringing
- FXO DC Resistance: 100Ω
- Maximum DC: 150 mA
- Overvoltage: UL 1950, FCC Part 68 lightning protection
- Overcurrent: 600 V rms, 60 Amps
- Protection: solid-state (fuseless) overvoltage and over current protection
- Termination Type: FXO loop start or ground start, switch selectable per card or via management interface per channel
- Signaling Selection: DPT functionality enabled/disabled on all 8 channels
- Address Signaling: DTMF or dial pulse
- Calling Party Disconnect: detects and forwards current interruption to disconnect answering devices and modems

Environment

In addition to the systems environment requirements, the following applies to the FXO card. For additional information see *Installation Environment on page 2-3*.

- Operating temperature range: 32° to 104° F (0° to 40° C)

Physical

- Connections made on wire-wrap pins on rear panel
- Dimensions: 3.5 in. (H) x 0.75 in. (W) x 11.25 in. (D)
  8.9 cm (H) x 1.9 cm (W) x 28.6 cm (D)
- Weight: 9.1 oz. (0.26 kg)

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Card Configuration

The FXO voice card can be configured, to support either FXO loop start or FXO ground start signaling, with various transmit and receive attenuation options.

CLI Commands

The following commands are used to configure the FXO card. For detailed information on these commands, see *Chapter 5, CLI Commands.*

- connect
  Creates two-way connections between channels
- *disconnect*
  Removes a connection created by the connect command
- *set (fxo)*
  To setup the voice channels parameters (rx gain, signal, tx gain)
- *show (fxo)*
  Displays the settings (type, signaling, RxGain, TxGain) for the FXO
- *status (ds0)*
  Displays the status (AB bits received, AB bits transmitted, signal, trunk processing) of the DS0s (AB Bit Monitoring)
- *status (fxo)*
  Displays the status (AB bits received, AB bits transmitted, signal, T1 activity, trunk processing) of the specified FXO (AB Bit Monitoring)

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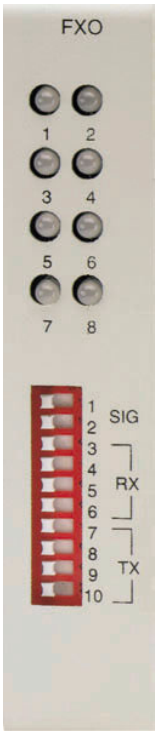
DIP Switch Settings

The FXO card DIP switches are not functional on the Axxius 800 platform.

LEDs

Each FXO port on a card has its own LED, described in the table below.



State	Loop Start Meaning	Ground Start Meaning	Dial Pulse Termination Meaning
Off	N/A	Idle (tip open)	Idle (loop open)
Green	Idle	Tip ground (incoming seizure)	Incoming seizure
Red	N/A	Ring ground (outgoing seizure)	Loop closure (outgoing seizure)
Yellow	Call in progress	Call in progress	Call in progress (reverse battery)
Flashing green	Ringing	Ringing	N/A

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Channel Associated Signaling (CAS) Conversions

Cross-connects are done at a DS0 level. The following rules need to be kept in mind while performing cross-connects for a FXO voice card.

T1 DS0 Signaling Type	FXO Card DS0 Signaling			
	LS	GS	DPT	LSCPD
LS (loop start)	Valid	Invalid	Invalid	Valid
GS (ground start)	Invalid	Valid	Invalid	Invalid
EMDW (E&M delayed wink start)	Invalid	Invalid	Invalid	Invalid
EMI (E&M immediate start)	Invalid	Invalid	Valid	Invalid
EMICPD (E&M Immediate Start with Calling Party Disconnect)	Invalid	Invalid	Invalid	Invalid
EMW (E&M wink start)	Invalid	Invalid	Invalid	Invalid

LS = Loop Start
GS = Ground Start
DPT = dial Pulse Termination
LSCPD = Loop Start Calling Party Disconnect

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CHAPTER 9

ISDN BRI Card

In this Chapter

- Overview
- Features
- Technical Specifications
- Card Configuration
  - CLI Commands
- LEDs
- Connector Pinouts
  - Wire-Wrap Pinout 2 Wire Services

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Overview

The ISDN BRI Service Cards enable service providers and enterprises to deploy high-density, standards-based, ISDN Basic Rate Interface (BRI) services over one or more T1 or DSL access lines using TDM or ATM transport. ISDN voice, data, and real-time video applications may be cost effectively deployed as part of any integrated broadband service delivery.

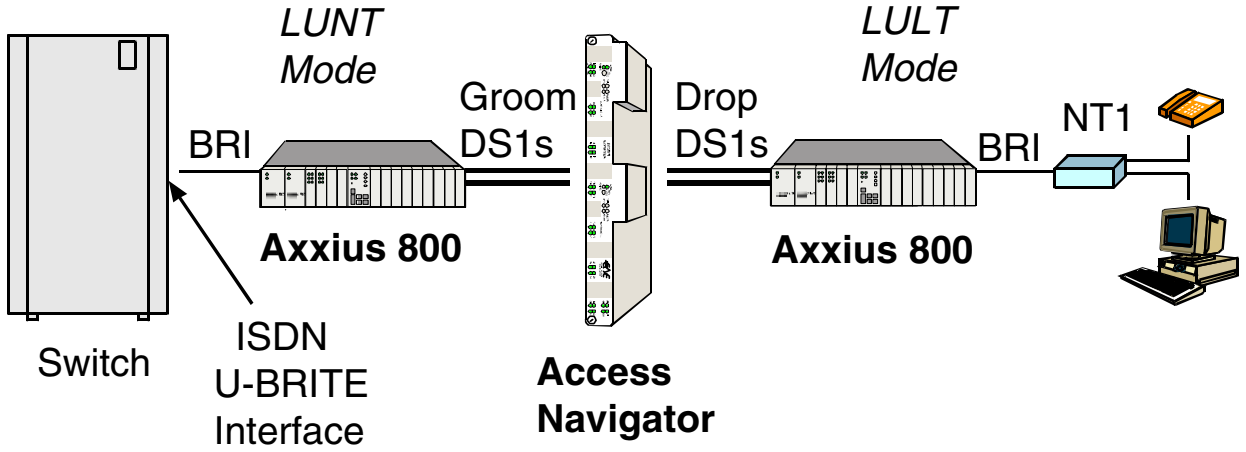
ISDN BRI

BRI provides an end-to-end digital connection for customers with voice, data and video needs. BRI has 2 Bearer (B) channels at 64 Kbps for voice or data and 1 Data or Delta (D) channel at 16 Kbps for signal and control. With some ISDN BRI devices, the two B-channels can be aggregated together for 128 Kbps capacity.

3-DS0 BRITE Mode

The ISDN BRI Card supports the 3-DS0 BRITE mode of operation. In this mode, three DS0 channels support a BRI channel, providing eight BRI per T1. The BRI channel consists of two B and a D channel (2B+D) which is also transported in a full DS0. The D-channel supports the Embedded Operations Channel (EOC) and is used to pass signaling and other management information, such as loopback commands.

The following is an example of how a Axxius 800 with a ISDN BRI card can function as a Line Unit Network Termination (LUNT) with central office applications, and a Line Unit Line Termination (LULT) with subscriber lines.



ISDN BRI Service Using 3DS0 Mode

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Features

- Enables carriers to economically bundle ISDN with all other services at 64 Kbps or 128 Kbps over T1 access lines
- Configurable as either Line Unit Line Terminal (LULT) for interfacing to ISDN switch interfaces at the central office, or Line Unit Network Terminal (LUNT) for customer premises deployment
- Provides direct NTU service demarcation for ISDN video conferencing, 128 Kbps dial-up Internet, point-of-sale terminals, and ISDN Centrex or telephone applications
- Enables high service density with up to 56 ISDN BRI lines from 7 T1 lines in a single Axxius 800 chassis, occupying two RU of equipment space (19-inch rack)
- Offers solid-state fuseless protection for central office NEBS compliance and customer premises FCC and UL safety requirements

Technical Specifications

Controller Software Required

- Release 1.1 or higher is required for the ISDN BRI service card

Product Includes

- Works with all standard Carrier Serving Area (CSA) loops - maximum 18,000 ft. range (#26 AWG copper)
- Supports standard Telcordia 3-DS0 mode
- Line coding: 2B1Q
- Line Rate: 160 Kbps (80 kbaud)
- Front-panel multi-function LEDs provide out-of-Service, LOS/Self-test fail, ES/SES detected, Sync, Loopback, and Normal indications
- Interoperable with other standards-based ISDN BRI equipment
- B1, B2, and 2B+D payload loopbacks supported
- Maximum bridged tap length is 2.5 kft. (762 m)
- Rear-accessed U-interface connections

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Management

- Standard ISDN SNMP MIB supported

Network Interface

- 3 DS0 mode: Uses 3 contiguous DS0 channels per ISDN BRI channel on T1

Network Standards

- Telcordia TR-NWT-000397 (1993)
- Telcordia TR-TSY-000821 (1991)
- Telcordia TR-TSY-000829 (1989)
- ANSI T1.601.1992
- ITU-T Q.920, Q.921

Clocking

- Loop timing derived from Channel 1 of ISDN BRI card or any Axxius 800 T1 line

Testing & Diagnostics

- Initiates 2B+D, B1, or B2 loopbacks toward the BRI at the NT1
- Performs self test at power up
- 3 DS0 mode: supports external loopback testing via EOC messages from the switch

Product Supports

- TR-821 alarms
- TR-397/TR-829/TR-821 Generic Segmented Performance Monitoring
- TR-829 multi-EOC messages in 3 DS0 mode
- Metallic DC test signature in Line Unit Network Terminal (LUNT) mode

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Power

- Maximum power input: 6 W (8 port)
- Solid-state fuseless protection

Environment

In addition to the systems environment requirements, the following applies to the ISDN BRI card. For additional information see *Installation Environment, on page 2-3.*

- Operating temperature range: 32° to 104° F (0° to 40° C)

Physical

- Dimensions: 3.5 in. (H) x 0.75 in. (W) x 11.25 in. (D)
  8.9 cm (H) x 1.9 cm (W) x 28.6 cm (D)
- Weight: 6.9 oz. (0.20 kg)

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Card Configuration

BRI card options are set with the Command Line Interface (CLI). For additional information on these commands, see *Chapter 5, CLI Commands*.

CLI Commands

- *connect*
  Creates two-way connections between channels
- *disconnect*
  Removes a connection created by the connect command
- *set (bri)*
  Setup of ISDN ports (up/down, threshold, call reference value)
- *set (bri) mode*
  Set up ISDN cards mode of operation (3-DS0 or 4:1)
- *set (bri) pmsync*
  Set up the BRI card source for performance monitoring synchronization
- *set (ds0)*
  For cross-connect to ISDN, must be data type
- *status (ds1)*
  Displays line status or performance statistics of a specific DS1
- *set clock*
  Set the primary and secondary (clock1/clock2) master transmit clock source
- *show (bri)*
  Displays BRI port configuration
- *show clock*
  Displays actual clock source
- *show (ds1)*
  Displays DS1 configuration
- *status (bri)*
  Displays port status or performance statistics for the specified BRI
- *status clock*
  Displays actual clock status and source

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LEDs

There is an LED for each ISDN BRI on a card. The function for each LED is listed below:

State	Description
Off	Line U-interface is attempting synchronization, or BRI is out of service.
Red	Line alarm (LOS or self test failure)
Yellow	ES or SES has occurred.
Flashing yellow	Line U-interface is synchronized with customer equipment, but is not passing customer data.
Flashing green	Line U-interface is in external loopback toward the switch at the unit.
Green	Normal (Line U-interface is active and transparently passing customer data.)

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Connector Pinouts

Wire-Wrap Pinout 2 Wire Services

The following pinout applies to the wire-wrap pinout for the slot of the ISDN BRI card.

Wire-Wrap Pins	Description
T1	Channel 1 Transmit Tip
R1	Channel 1 Transmit Ring
T2	Channel 2 Transmit Tip
R2	Channel 2 Transmit Ring
T3	Channel 3 Transmit Tip
R3	Channel 3 Transmit Ring
T4	Channel 4 Transmit Tip
R4	Channel 4 Transmit Ring
T5	Channel 5 Transmit Tip
R5	Channel 5 Transmit Ring
T6	Channel 6 Transmit Tip
R6	Channel 6 Transmit Ring
T7	Channel 7 Transmit Tip
R7	Channel 7 Transmit Ring
T8	Channel 8 Transmit Tip
R8	Channel 8 Transmit Ring

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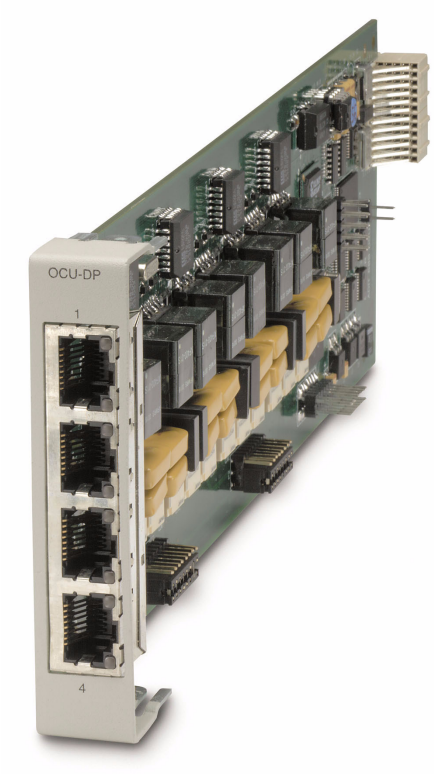
CHAPTER 10

OCU-DP Card



In this Chapter

- Overview
- Features
- Technical Specifications
- Card Configuration
  - CLI Commands
  - Basic Setup
- LEDs
- Jumper Settings
- Alarms
- Line Rates/Line Lengths
- Connector Pinouts
  - DDS RJ-48S
  - Wire-Wrap Pinout 4 Wire Services

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Overview

The Single Port and Quad Port all-rate OCU-DP Service Cards provide electrical and physical termination of the 4-wire Digital Data Service (DDS) that is traditionally used to interconnect lower-speed serial synchronous Data Terminal Equipment (DTE) devices such as routers, Frame Relay Access Devices (FRAD), or video conferencing equipment. Now DDS can be integrated with DS0 voice, fractional T1 data, ISDN, and IP services – over multiple T1s or DS3s. This enables service providers to deliver transport for legacy enterprise data networking or Common Channel Signaling (CCS) circuits commonly used in Signaling System 7 (SS7) telephone networks using one card for all standard DDS types. Plus, it can be used as a replacement for low-density, unmanaged D4 channel banks.

The OCU-DP Service Cards provide scalable, independently configurable, synchronous data service rates from 2.4 Kbps to 64 Kbps, including Switched 56 Kbps data rates. Up to eight OCU-DP cards can be inserted into any of the service card slots of the Axxius 800, providing up to 32 DDS connections. These cards enable industry-leading density and cost per port at Central Offices (COs) hub and collocations (COLOs) and cell sites.

For example, the Axxius 800 OCU-DP ports can be groomed and mapped into any of the DS1 or DS3 ports of the Controller. The Axxius 800's (3/1/0) digital cross-connect functionality offers DS0 service grooming, T1 drop-and-insert, and voice access integration not available in traditional multiplexers.

The OCU-DP Service Cards have several local and remote management options available through the Axxius 800 Controllers. Cards can be locally configured and managed using the Command Line Interface (CLI). Remote management is accomplished directly over either an in-band DS0 management channel or a separate SNMP network connection, alternatively, remote management can be achieved through the Access Navigator® over the Facility Data Link (FDL) or an in-band dedicated DS0. Remote management will be further simplified using the graphical configuration, and management and maintenance interfaces available in future releases of the NetworkValet™ Enhanced Management System (EMS).

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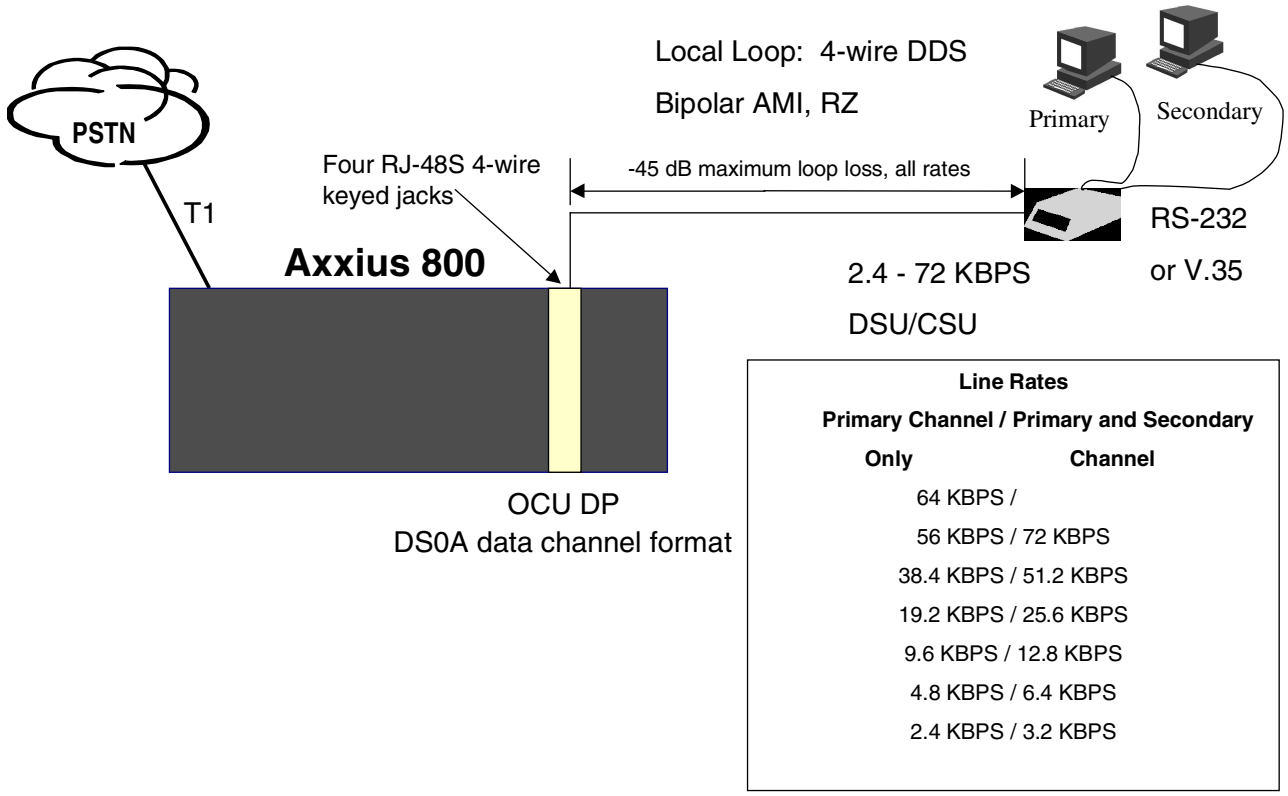
Customer Premise Application



Line Rates	
Primary Channel / Primary and Secondary Channel Only	
64 KBPS /	
56 KBPS / 72 KBPS	
38.4 KBPS / 51.2 KBPS	
19.2 KBPS / 25.6 KBPS	
9.6 KBPS / 12.8 KBPS	
4.8 KBPS / 6.4 KBPS	
2.4 KBPS / 3.2 KBPS	

In this model, the carrier deploys the Axxius 800 in conjunction with DDS DSU/CSUs to provide standards-based DDS access for customer data terminal needs. In essence, the Axxius 800 integrates the DDS capabilities that were traditionally served by D4 or DLC Remote Terminal equipment into a customer premise multi-service solution.

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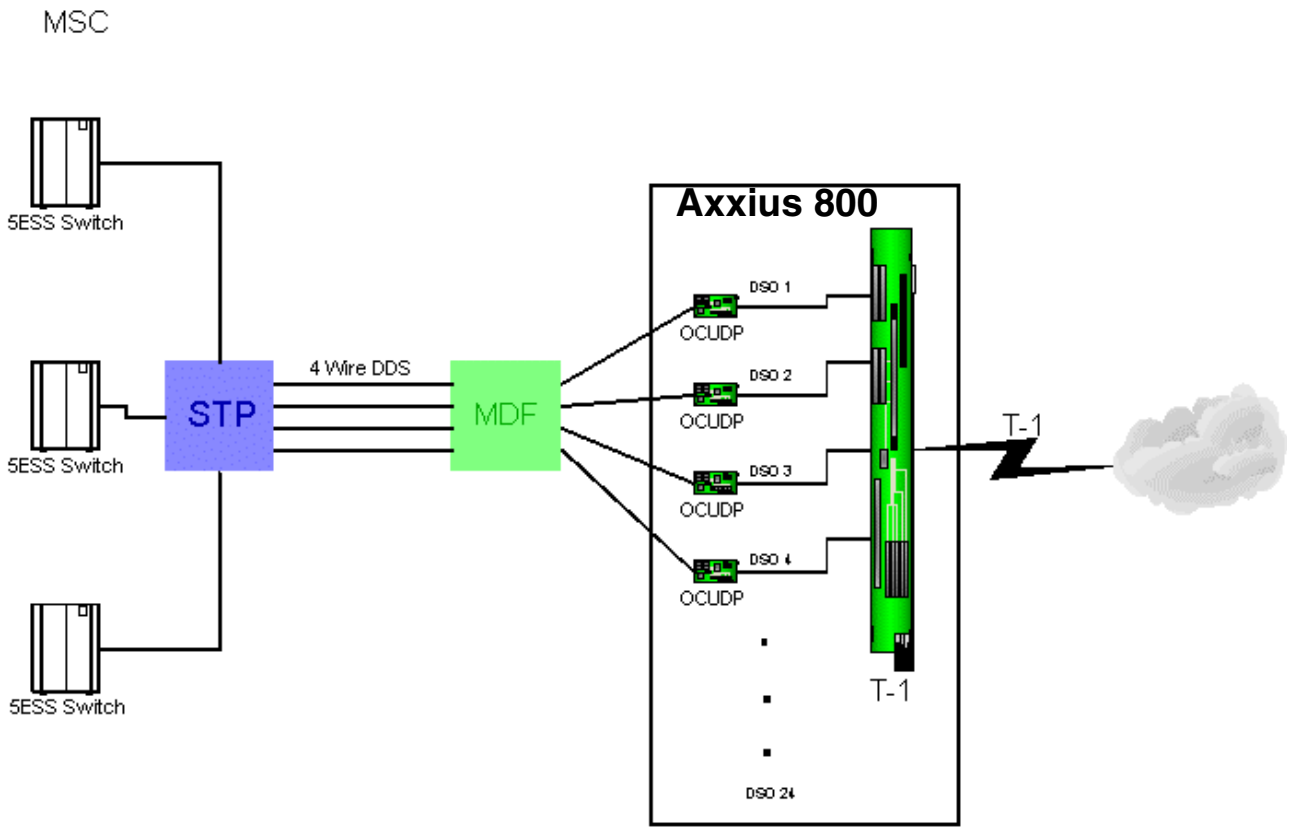
SS7 Backhaul Application



In this application, the carrier uses the OCU to transfer signaling and call information between MSCs.

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Features

- Provides available baseband data rates from 2.4 to 72 Kbps
- Supports primary and secondary channel services, 64K clear channel service, and 4-wire Switched-56 service
- Complies with AT&T Pub. 62310
- Offers Bipolar Violation (BPV), Loss of Frame (LOF-DDSII), Loss of Signal (LOS) and Out-of-Service (OOS) performance counters: 15 minute, 1 hour and 24 hour intervals available
- Offers BPV, OOS, LOF and LOS selectable alarm thresholds
- Supplies built-in self-tests including data path and RAM test status and TDM and CSU failures
- Supports DDS network control codes for OCU, CSU and DSU latching and non-latching service loopbacks
- Supports system timing from any T1 line and provides it to the connected DTE
- Deploys up to 32 OCU-DP service ports in a single Axxius 800 chassis

Technical Specifications

Controller Software and Hardware Required

- Release 1.1 or higher is required for the OCU-DP service card
- -48V NI48V Power Supply (P/N 740-0084) is required for this card

Service Interface

- Single-port OCU-DP interface
  - One RJ-48S front-panel jack
  - Wire-wrap pins for rear-panel connection
- Quad-port OCU-DP interface
  - Four RJ-48S front-panel jack
  - Wire-wrap pins for rear-panel connection

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Network Interface

- Each OCU port DS0 cross-connected to T1 port

Loopbacks

OCU, CSU and DSU:

- Manual loopbacks activate via CLI
- Non-latching loopbacks activate via network code
- Latching loopbacks activate via network code

Clocking

- Loop-timed from any T1 in the platform
- Sources clock to the DTE device

Power Consumption

- 6 W maximum, Quad-Port OCU-DP card
- 3 W maximum, Single-Port OCU-DP card

Environment

In addition to the systems environment requirements, the following applies to the OCU-DP card. For additional information see *Installation Environment on page 2-3*.

- Operating temperature range: 32° to 104° F (0° to 40° C)

Physical

- Dimensions: 3.5 in. (H) x 0.75 in. (W) x 11.25 in. (D)
  8.9 cm (H) x 1.9 cm (W) x 28.6 cm (D)
- Weight: 5.7 oz. (0.16 kg)

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Card Configuration

OCU-DP card options are set with the Command Line Interface (CLI). For additional information on these commands, see *Chapter 5, CLI Commands*.

CLI Commands

Configuration Commands

- *set lsbackup*
  Set up OCU-DP port baud rate
- *set (ocudp) loopdetect*
  Set OCU-DP non-latching/latching loopback code detection
- *set (ocudp) mvec*
  Set Majority Vote Error Correction (MVEC)
- *set (ocudp) secondary*
  Set up the secondary channel service
- *set (ocudp) up/down*
  Set the OCU-DP line In or Out-of-Service.

Test Commands

- *set (ocudp) loopback*
  Set the manual loopback tests
- *set (ocudp) selftest*
  Start the OCU-DP self test

OCU-DP Status Commands

- *clear (ocudp) performance*
  Clear OCU-DP status counters
- *show (ocudp)*
  Displays OCU-DP card configuration (baud, loopdetect, error correction, switched and enhanced switched service and secondary channel provisioning)
- *status (ocudp)*
  Displays the status or performance statistics of the OCU-DP card (OOS, LOF, LOS and BPV seconds)

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Basic Setup

Command	Description
`set {ocudp-addr} baud {2400|4800|9600|19200|38400|56000*|64000}`	Set the OCU-DP Baud rate. Where ocudp-addr = {slot:port} of the OCU-DP card to apply settings to.
`set {ocudp-addr} up`	Set the OCU-DP port 1 up.
`show {ocudp_card-addr}`	Show the OCU-DP card settings. Where ocudp_card-addr = {slot} of the OCU-DP card.
`disconnect a`	Disconnects all connections to slot a (controller)
`set {ds0-addr} type data`	Sets a DS0 data signaling type
`connect {ds0-addr} {ocudp-addr}`	Connects DS0 (in previous step) to OCU-DP port (in previous step).
`show connect (ocudp_card-addr}`	Displays connect information for OCU-DP card.

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LEDs

There are two LEDs for each channel on the OCU-DP card. The function for each LED is listed below:

State		Description
Yellow Flickering	ALL	Boot Software in control.
Green (walking down) Red (walking up)	ALL	Application Software in control (repeated 3.5 times).
Red, slow flash	ALL	In Boot. Application flash code checksums did not match and Boot is waiting for application download.
Red	ALL	In Application code waiting for Controller to issue SW/HW revision request. This is the first request that comes from the OCU-DP card manager in the Controller.
Green Yellow	Top Bottom	Port in Self-test. Duration is 5-8 seconds.
Off	Top Bottom	Port is set down (Out-Of-Service).
Green	Top	Port is receiving valid signals.
Red	Top	Port is receiving no signal (primary) or no frame sync (secondary or clear channel).
Red Flashing	Bottom	Port is receiving bipolar violations
Yellow	Bottom	Port is in loopback.

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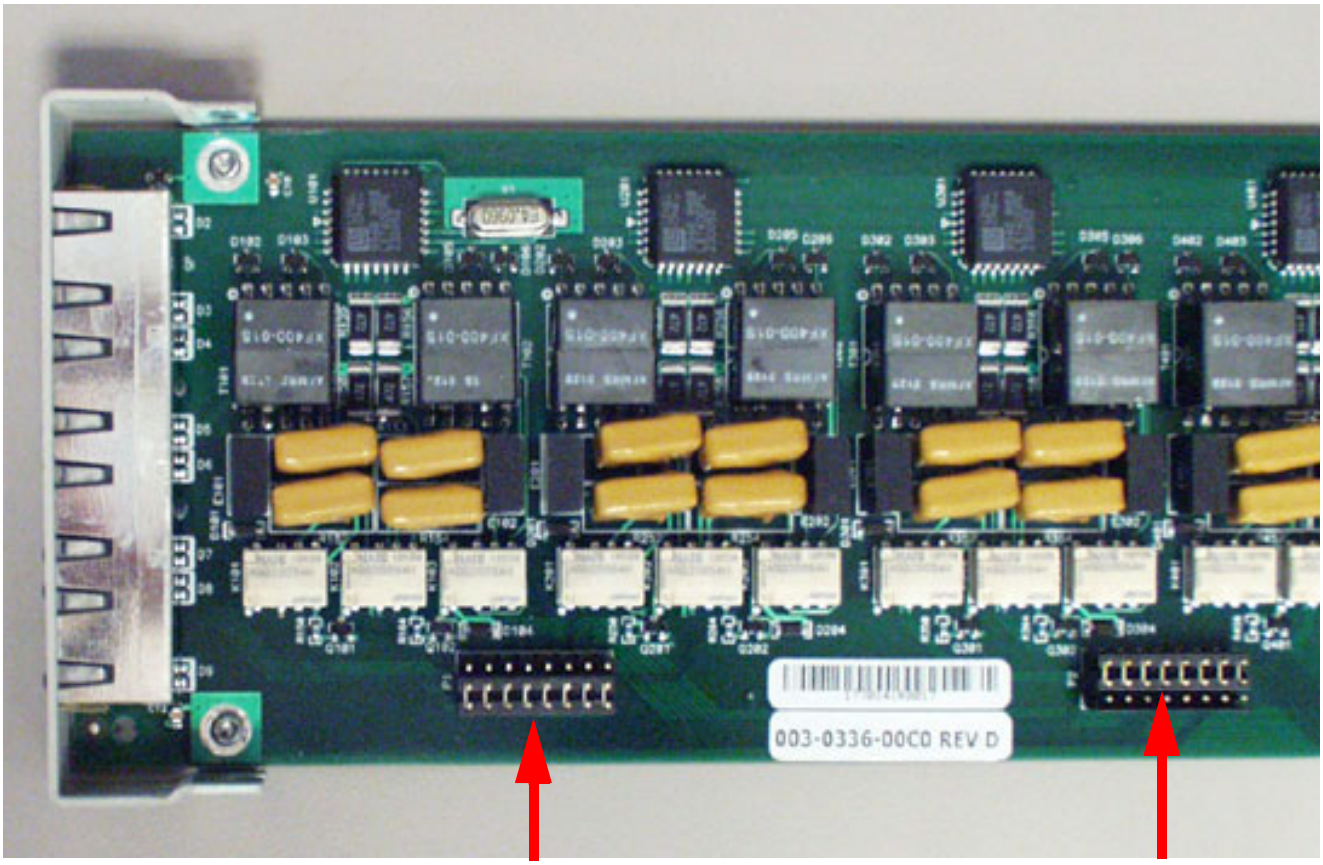
Jumper Settings

The P1 and P2 Jumpers are defaulted to RJ-48S, which are the set of pins nearest the bottom of the service card. With the jumper in this position the signals are routed to the RJ-48S connector(s) on the face of the card. To route the signals to the 25-pin Telco connector at the rear of the unit, move the jumpers to the backplane position, which is the set of pins toward the top of the service card.

P1 applies to connectors 1 and 2 (connector 2 only with the 4 port card).
P2 applies to connectors 3 and 4 (for the four port card only).

Top of Card



Front of Card

P1 is set to RJ-48S Position

P2 is set to 25-Pin Telco Position

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Alarms

The OCU-DP cards and supporting Controller Software will support the following alarms:

Alarm/ Event	Severity	Category	Description	Clear Mechanism (alarms only)
Card Detect	Information	Equipment	OCU-DP card inserted	
Card Removed	Information	Equipment	OCU-DP card removed	
Out of Service (OOS)	Major	Facility	Network sending Out-of-Service code (OOS) or card has LOS.	Correct with Network or replace or deprovision the card.
Los of Signal (LOS)	Major	Facility	No signal at customer link.	Correct with Customer data path, replace the card, or reconnect the drop.
Los of Frame (LOF)	Major	Facility	Framing patter not detected at customer link.	Correct with Customer data path, replace the card, or reconnect the drop.
Bipolar Violation (BPV)	Minor	Facility	Excessive violations on customer interface.	Correct with the incoming signal, or deprovision card.

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Line Rates/Line Lengths

All lengths were measured to meet a BER of 10^{-7} with up to 45 dB of cable attenuation at the Nyquist frequency for 56, 64 and 72 Kbps, and 40 dB all other rates.

Service Data Rate	Primary Channel / Secondary Channel	Max. Loop Distance (24 AWG) Primary Channel only/Primary & Secondary Channel	
2.4 Kbps	2.4 Kbps/3.2 Kbps	13.8 miles/12.7 miles	(22.3 km/20.4 km)
4.8 Kbps	4.8 Kbps/6.4 Kbps	11.0 miles/10.0 miles	(17.7 km/16.1 km)
9.6 Kbps	9.6 Kbps/12.8 Kbps	8.0 miles/13.3 miles	(13.0 km/12.2 km)
19.2 Kbps	19.2 Kbps/25.6 Kbps	6.3 miles/5.9 miles	(10.1 km/9.4 km)
38.4 Kbps	38.4 Kbps/51.2 Kbps	5.5 miles/5.3 miles	(8.8 km/8.5 km)
56 Kbps	56 Kbps/72 Kbps	5.1 miles/4.7 miles	(8.2 km/7.6 km)
64 Kbps	64 Kbps	4.7 miles	(7.6 km)

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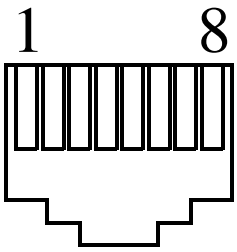
Connector Pinouts

The OCU-DP is part of the network, it connect to customer equipment.

DDS RJ-48S

The pinout for RJ-48S female is as follows:



Pin	Function	Description
1	Receives Data (R-1)	From Customer to Network Interface
2	Receives Data (T-1)	From Customer to Network Interface
3-6	Not Used	
7	Transmits Data (T)	From Network Interface to Customer
8	Transmits Data (R)	From Network Interface to Customer

Note: The above listed functions are relative to this port.

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Wire-Wrap Pinout 4 Wire Services

The following pinout applies to the wire-wrap pinout for the slot of the OCU-DP card.

Wire-Wrap Pins	T1	Name	Description
1RX	Port 1	Receive Ring	Receive from DS1 network
		Receive Tip	Receive from DS1 network
1TX		Transmit Ring	To DS1 network
		Transmit Tip	To DS1 network
2RX	Port 2	Receive Ring	Receive from DS1 network
		Receive Tip	Receive from DS1 network
2TX		Transmit Ring	To DS1 network
		Transmit Tip	To DS1 network
3RX	Port 3	Receive Ring	Receive from DS1 network
		Receive Tip	Receive from DS1 network
3TX		Transmit Ring	To DS1 network
		Transmit Tip	To DS1 network
4RX	Port 4	Receive Ring	Receive from DS1 network
		Receive Tip	Receive from DS1 network
4TX		Transmit Ring	To DS1 network
		Transmit Tip	To DS1 network

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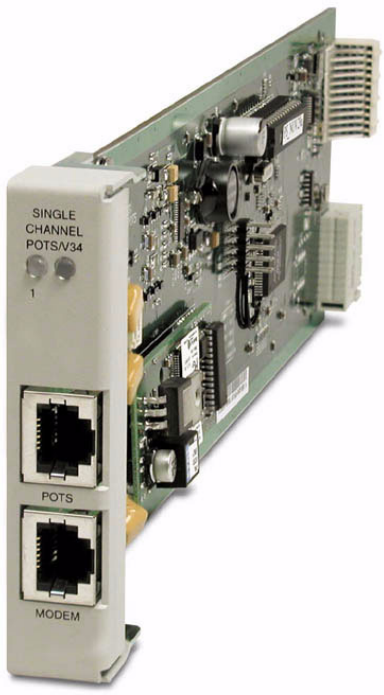
CHAPTER 11

Single Channel POTS Cards



In this Chapter

- Overview
- Features
- Technical Specifications
- Card Configuration
  - CLI Commands
- Connector Pinouts
- LEDs
- Basic Configuration

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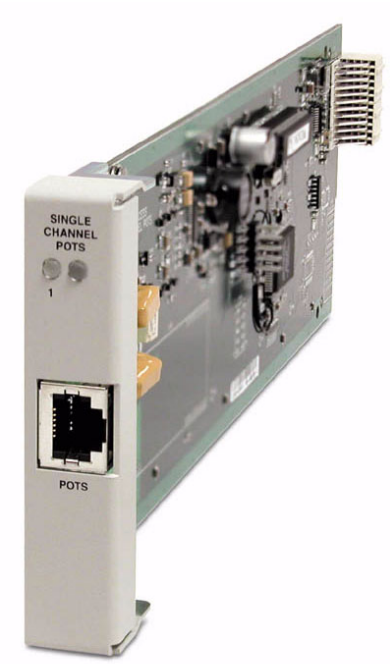
Overview

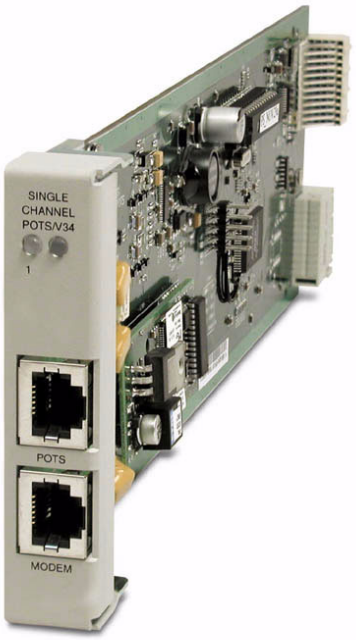
A Single Channel POTS card provides wireless service providers a standard FXS voice circuit for communications, with the operations support group under conditions where the cell site radios are being serviced. The Single Channel POTS card features a single RJ-11 telecom connection, and is available with or without an integrated V.34 modem for remote management of the Axxius platform over a dial-in connection. These cards can be inserted into any service card slot of the Axxius 800.



The integrated dial-in V.34 modem port connects the remote technician to the Axxius DS3 or T1 Controller card for remote CLI configuration. Additional local or remotely management options are available for the Service card as a component of the Axxius 800 platform. The card can be configured using CLI or via or NetworkValet graphical interface.

Features

- Provides a lifeline order wire connection for communications from the remote cell sites during radio maintenance
- Offers solid-state overvoltage and fuseless overcurrent protection from lightning and power cross incidents



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Technical Specifications

Controller Software Required

- Release 1.0 or higher is required for the POTS Service cards

FXS Transmission Performance

- Return Loss: ERL > 28 dB, SRL > 20 dB with respect to 900Ω + 2.16µF
- Transhybrid Loss: ERL > 28 dB, SRL > 20 dB with respect to 900Ω + 2.16µF
- Idle Noise: A/D ≤ 25 dBrnC0
- Signal/Distortion: > 45 dB with 1004 Hz, 0 dBm0 input
- Terminating Impedance: 900Ω + 2.16µF
- Transmit Gain/Loss: +4 to -12 dB (in .25 increments)
- Receive Gain/Loss: +4 to -12 dB (in .25 increments)
- Overload: +3.0 dBm0
- Frequency Response: +0 dB -1.0 dB from 300 to 3400 Hz
- Longitudinal Balance: >50 dB
- Modem support: full compatibility with V.90 modems

Modem Performance

- The Single Channel POTS card modem is registered for direct connection to the PSTN

FXS Signaling Performance

- DC Loop Range: 512 Ω
- Loop Feed: Nominal -48 VDC with 26mA current limit
- Ringing Voltage: 40 V rms, 20 Hz
- Maximum Ringers: 2 REN, FCC Class B ringers
- FXS Signaling: FXS loop start

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Physical

- POTS connections are through front panel RJ-11
- Dimensions: 3.5 in. (H) x 0.75 in. (W) x 11.25 in. (D)
  8.9 cm (H) x 1.9 cm (W) x 28.6 cm (D)
- Weight: Single Channel POTS - 5.1 oz. (0.14 kg)
  Single Channel POTS w/Modem - 6.0 oz. (0.17 kg)

Environment

In addition to the systems environment requirements, the following applies to the Single Channel POTS card. For additional information see *Installation Environment on page 2-3.*

Single Channel POTS card with Modem

Note: this card is not hardened.

- Operating temperature range: 32° to 149° F (0° to 65° C)

Single Channel POTS card

- Operating temperature range: -40° to 149° F (-40° to 65° C)

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Built-In Card Handles

The Single Channel POTS cards are designed with a handle built into the faceplate to assist in the removal of the card from the chassis. This handle slides out away from the unit, creating a handle for a more effective grip.

Card Configuration

The Single Channel POTS card can be configured, using CLI commands.

CLI Commands

The following commands are used to configure the POTS cards. For detailed information on these commands, see *Chapter 5, CLI Commands.*

- *connect*
  Creates two-way connections between channels
- *disconnect*
  Removes a connection created by the connect command
- *set (fxsPS or fxsPSM)*
  To setup the voice channels parameters (rx gain, signal, tx gain).
- *show (fxsPS or fxsPSM)*
  Displays the settings (type, signaling, rx gain, tx gain) for the FXS PS cards.
- *status (fxsPS or fxsPSM)*
  Displays the status (AB bits received, AB bits transmitted, signal, T1 activity, trunk processing) of the specified FXS PS cards.

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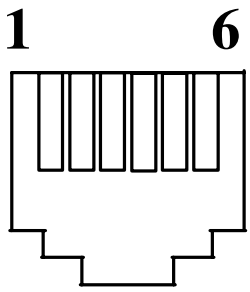
Connector Pinouts

RJ-11 Connector

There is one RJ-11 (female) connector on the front of the POTS card and two RJ-11 connectors on the POTS card with modem.



The pinouts are as follows:

Pin	Name	Description
1	n/c	Not connected
2	n/c	Not connected
3	R	Ring
4	T	Tip
5	n/c	Not connected
6	n/c	Not connected

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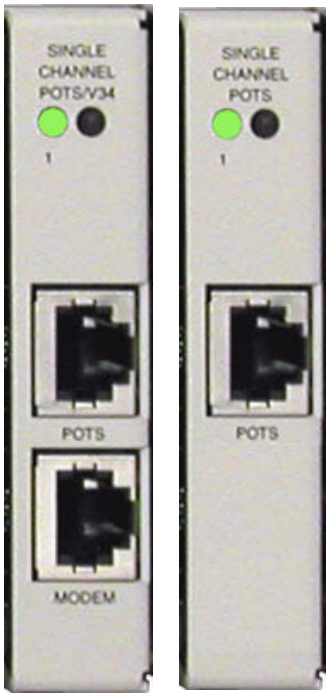
LEDs



The POTs channel LED (left) status is described in the table below.

State	Loop Start Meaning
Off	Calling Party Disconnect
Green	Idle
Red	N/A
Yellow	Call in progress
Flashing green	Ringing

The second LED (right) is a status LED for the MODEM.

State	Description
Off	Calling Party Disconnect
Green	Ringing
Yellow	Carrier Detect

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Basic Configuration

WARNING! DO NOT INSTALL TWO SINGLE CHANNEL POTS SERVICE CARDS WITH MODEM IN A AXXIUS CHASSIS. IF YOU DO, THE SYSTEM WILL HANG. TO RESOLVE, YOU MUST REMOVE BOTH CARDS AND PLUG ONLY ONE BACK IN.

Set Up the Single Channel POTS Line

Use the following commands to set up an analog port.

Command	Description
`set a:1:1 type voice`	Set the DSO to voice. See *set (ds0)* for details.
`connect a:1:1 8:1`	Connect the DSO A:1:1 to port 1 of the Single Channel POTS card in slot 8. See the *set (fxsPS or fxsPSM)* command for details.
	Assign this DS0 a phone line
	Connect phone
	Test phone for dial-tone

Set Up the Single Channel POTS Modem

Use the following commands to set up an analog port.

Command	Description
`Connect a phone line to the Modem port`	
`>atdt3032180000`	`Via HyperTerm call the line (phone number)`
`MODEM>`	Once a modem connection is made, the screen will reflect this.

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CHAPTER 12

Power Supply

In this Chapter

- Overview
- Features
- Technical Specifications
- Input Power
- LEDs
- Installing/Replacing a Power Supply

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Overview

The Axxius 800 Power Supply options operate from either 24 VDC or 48 VDC to supply 5V power to the Axxius platform. A single Power Supply is capable of powering the entire Axxius 800 unit. Equipping the Axxius with two Power Supplies provides a simultaneously shared, redundant power feed to the unit. Front panel LEDs provide easy-to-read power status and alarms. The Power Supply can remotely notify network operations and monitoring centers of power faults through the Axxius SNMP or NetworkValet EMS.

The 48 VDC power supply is available in two versions:

48 VDC I48 - the standard -48 VDC power supply.

48 VDC NI48 - provides non-isolated -48 volt to the backplane, to support the FXO and OCU-DP Service cards.

Features

- Enables the Axxius 800 to be powered from 24 VDC or 48 VDC sources
- Output voltage galvanometrically isolated from input voltage; supports either + or - input voltage
- Supports high capacity applications
- Redundant sharing design for service critical applications
- Active sharing circuitry ensures long life for both Power Supplies
- Thermally hardened for operation from -40 to 149 ºF ambient temperatures
- Input current inrush-limiting feature prevents excessive system voltage droop and false fuse trips
- Ensures service availability with LED status, monitoring, and remote alarming capabilities
- Facilitates quick and simple installation using connectorized design
- Meets UL and CSA safety requirements

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Technical Specifications

Components

- 24 VDC Power Supply
- 48 VDC NI48 Power Supply
- 48 VDC I48 Power Supply
- Cable connector

Electrical Input Characteristics

Input power fully isolated from circuit and chassis ground

24 VDC

- 24 (21.0 to 30.0) VDC, +5 ADC, 120 W rated input
- Startup at 22 V maximum
- Low voltage shutdown at 19 V minimum
- High voltage shutdown at 33 V minimum
- Maximum cold start inrush current: 15 A peak at 30 VDC

48 VDC

- 48 (41.0 to 60.0) VDC, 2.5 ADC, 120 W rated input
- Startup at 44 V maximum
- Low voltage shutdown at 37.5 V minimum
- High voltage shutdown at 66.0 V minimum
- Maximum cold start inrush current: 7.5 A peak at 60 VDC

Electrical Output Characteristics

- 5 VDC, 20 A maximum

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Alarms

- Communicates status to Controller when 24 or 48 VDC input voltage is low

Interface Connectors

- Rear PCB connector: Axxius 800 backplane

Environment

In addition to the systems environment requirements, the following applies to the Power Supplies. For additional information see *Installation Environment on page 2-3*.

- Operating temperature range of the Power Supplies: -40° to 149° F (-40° to 65° C)

Physical

- Connections made on front of card using RJ-11 connector
- Dimensions: 3.5 in. (H) x 1.75 in. (W) x 11.25 in. (D)
  8.9 cm (H) x 4.4 cm (W) x 28.6 cm (D)
- Weight: 1 lb. 2 oz. (0.51 kg)

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Input Power

The following graphic displays the back of the Axxius chassis, with the Input power for the Power Supply slot A and B noted.

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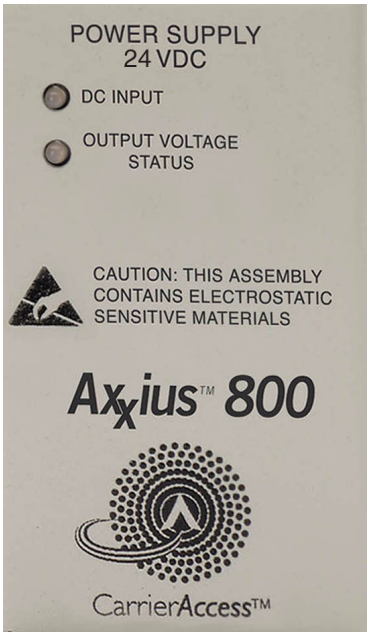
LEDs



Both power supply cards have identical LEDs, as described in the table below.

LED	State	Description
DC Input	Off	DC input missing or fuse blown
	Yellow	Under or over-voltage
	Green	Valid DC input present
Output Voltage Status	Off	No 5V output (neither power supply operating)
	Red	5V output not functioning (2nd unit operating)
	Green	5V output good

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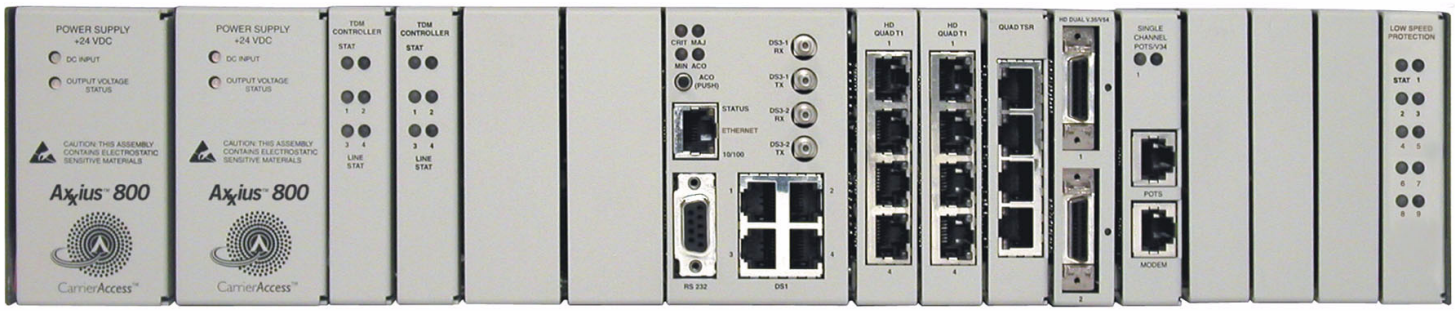
Installing/Replacing a Power Supply



Power 1 Power 2

Front

Install a Power Supply

The Axxius has redundant Power Supply System capability. The unit will run on one power supply (and not be redundant) or can have 2 power supplies installed.

1. Connect the power cord to the associated connector (Power 1 or Power 2). See *Power Connections on page 3-7* for details on the Power Connector. **Note: this step is for installation only.**
2. Simply slide the Power Supply into the Power 1 or Power 2 slot following card guides.
3. Press gently on the faceplate of the power supply to ensure that the connector on the power supply is fully mated to its mating connector on the backplane.
4. Both front panel LEDs should illuminate green.

Remove a Power Supply

Remove power supply by grasping faceplate at top and bottom and pulling power supply straight out of the case. If this is a redundant system, this will not effect power to the system.

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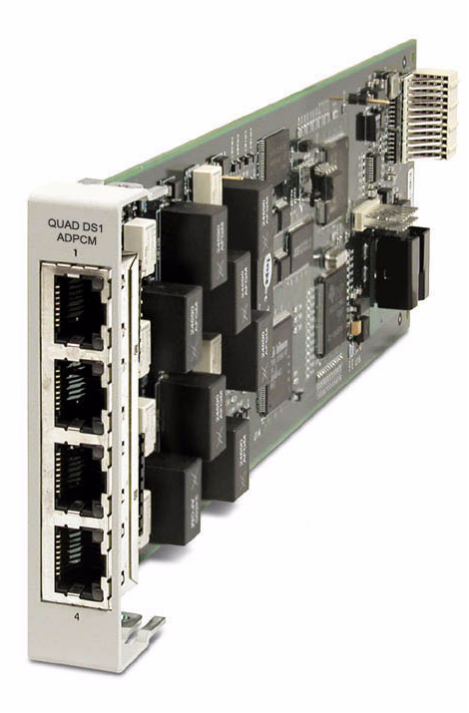
CHAPTER 13

Quad DS1 ADPCM Card



In this Chapter

- Overview
- Features
- Technical Specifications
- Card Configuration
  - CLI Commands
  - Cross-Connects
  - Basic Setup
- Jumper Settings
- Connector Pinouts
  - RJ-48 Connector
- LEDs

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Overview

The Quad DS1 ADPCM Service card is a component of the Axxius 800 Access Integration Platform. With the ADPCM Service card, the Axxius 800 provides an intelligent, compact device that can compress and groom voice traffic, which increases bandwidth utilization and reduces costs. Using Adaptive Differential Pulse Code Modulation (ADPCM), the ADPCM Service card compresses selected voice timeslots from one of the T1 ports. Compression maps are CLI configurable for the ADPCM port.

The ADPCM Service card is capable of packing two analog voice channels into a single DS0 and functions simultaneously as a digital cross-connect switch for grooming, bypassing or switching any combination of 64 kbps timeslots. It supports four T1 circuits and includes integral T1 CSU circuitry. V.35/RS-530 high-speed data ports, for integral DSU operation, can be added to the platform with the Dual V.35 Service Card and gives users the ability to drop and insert local data into available timeslots.

The ADPCM Service card utilizes industry-standard ADPCM voice compression techniques to increase the voice capacity of T1 links. It offers flexible timeslot assignments for mapping and configuration of compressed and non-compressed clear channels to groom voice and data to meet network traffic requirements between remote cell sites and the Mobile Switching Center (MSC). Data and digital traffic (i.e., GSM, CDMA, and TDMA) can ride along with compressed analog voice traffic over standard T1 circuits for supporting mixed analog and digital cellular sites.

The Axxius 800 DS1 or DS3 Controller Cards manage and control the ADPCM Service card. The ADPCM Card is a highly integrated single-module solution that can be fully integrated with additional service cards. Hardware investments are protected as user networking needs change.

NOTE: There are 4 ports on the DS1 ADPCM Service card, only port 1 supports the ADPCM function.

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Features

- 32 Kbps ADPCM voice compression
- Supports Clear Channel Signaling and line formatting for 32 Kbps ADPCM voice-band signals according to ANSI T1.302-1989
- Grooms the voice and data mix from selectable channel control options
- Supports up to 14.4 Kbps analog encoded data
- 4 DS1/T1 interfaces with integrated CSU, (DSX1 or DS1 port selections)
- Operates end-to-end with existing transcoder equipment at the MSC
- One modular integrated platform for DS3, DS1, V.35, POTS, 10/100 interfaces

Technical Specifications

Controller Software Required

- Release 2.0 or higher is required for the ADPCM service card

T1 Interface

- 4 T1 ports operating at 1.544 Mbps ±50 bps
- T1 Port 1 provides ADPCM voice compression capability
- Expansion to 36 T1 ports in a single chassis using Quad T1 or Quad DS1 ADPCM Service cards
- SF (D4) or ESF framing, AMI or B8ZS line coding (DS1 operation)
- Short-haul or long-haul loop settings for T1
- 4 RJ-48C front interface access (Control Panel Interface card) or rear wire-wrap pins (selectable)
- T1 Line Interface: T1-CSU or T1-DSX (field selectable)
- Line Build Out (DSX-1): 655 feet
- Receive Sensitive (DS1): 0 to -22 dB @ 772KHz ALBO
- Output Level (DS1): Selectable at 0 to -22 dB

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T1 Interface (continued)

- Jitter: meets AT&T Pub. TR-62411
- Solid-state fuseless overvoltage and overcurrent line protection
- Channel status LEDs
- Less than 3 ms signaling latency
- Less than 10 ms overall Axxius 800 system signaling latency

ADPCM Signaling

- Clear Channel Signaling passed on 64K clear channel
- 24-channel 32 Kbps ADPCM compression

Management

- Managed by Axxius 800 DS1 or DS3 Controller Craft or SNMP Interface

Synchronization

- Provides reference clock to backplane from selected T1

Network Standards

- RFC 2495
- ANSI T1.403-1995, T1.231-1993
- ITU G.703, G.704
- 32 Kbps ADPCM voice compression per ANSI T1.302-1989

Clocking

- Loop-timed from any T1
- External from BITS clock input (T1.101, T1.102 signal type)
- Revertive or non-revertive (provisionable) clock switching provides automatic backup to secondary T1 should the primary T1 fail
- Operates as a Stratum 4E device as defined by Telcordia GR-1244-CORE and AT&T TR 62411

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Alarms

- Support standard T1.403 alarms
- LOS (Loss of Signal), Red, Yellow, Blue
- ESF Performance Error Count Threshold
- Timing Loss
- All alarms are logged in an event log
- Loss of power triggers minor alarm
- Generates SNMP traps for alarming

Testing and Diagnostics

- T1.403 payload loopbacks (ESF only)
- T1.403 remote and local line loopbacks (ESF and SF)
- T1.231 Performance History (15 minute intervals, 24 hour totals)
- T1.403 Performance Report Messages (PRMs)

Power Consumption

- Less than 4.5 W per card

Environment

For systems environment requirements, see *Installation Environment on page 2-3.*

Physical

- Dimensions: 3.5 in. (H) x 0.75 in. (W) x 11.25 in. (D)
  8.9 cm (H) x 1.9 cm (W) x 28.6 cm (D)
- Weight: 5.1 oz. (0.14 kg)

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Card Configuration

All options on the this Service card are set using the Command Line Interface (CLI).

CLI Commands

The following commands are used to configure the Quad DS1 ADPCM card. For detailed information on these commands, see *Chapter 5, CLI Commands.*

- *connect*
  Creates two-way connections between channels.
- *disconnect*
  Removes a connection created by the connect command.
- *set (ds1 card) adpcm map*
  Sets the voice compression map on the ADPCM card (none, map 1, map 2 or map 3).
- *set (ds1)*
  Sets up the DS1 interfaces (clock, up, down, fdl, framing, id string, lbo, line, linecode, loopdetect).
- *set lsbackup*
  Defines the backup protection slot.
- *set lsprotect enable/disable*
  Enables or disables the Low Speed Protection options on the system.
- *set lsprotect manual*
  Sets the manual mode control for protected ports.
- *set lsprotect nonrevertive*
  Defines the port non-revertive status and priority level.
- *set lsprotect remove*
  Removes port from protected mode.
- *set lsprotect revertive*
  Defines the port revertive status and priority level.

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- *show (adpcm)*
  Displays current settings for the ADPCM card (circuit ID, up.down, framing, line coding, line build out, loop code detection, loop back, fdl type, ADPCM, ADPCM Map)
- *show connect adpcm*
  Displays the connections for the ADPCM port.
- *show (ds1)*
  Displays current settings for DS1
- *show lsprotect*
  Displays the low speed protection settings.
- *status (adpcm)*
  Displays the status of the ADPCM card (receive, transmit, loopback)
- *status (ds1)*
  Displays the status of the DS1 (receive, transmit, loopback)
- *status lsprotect*
  Displays the current status of the low speed protection cards.

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Basic Setup

Before configuring the DS1 ADPCM card, there are some basics that need to be considered:

- All DS0s to be compressed reside on T1 number 1 of the ADPCM card
- ADPCM is capable of transporting any combination of 64 and 32K
- All 24 DS0s can be transported either compressed or uncompressed, but not both at the same time.
- All DS0s to be compressed must be set to *type data*.

The following is a basic setup:

Command	Description
`Connect T1 cable to port 1 of the ADPCM service card`	
`set {adpcm_card-addr} {none|map1|map2|map3}`	Enable compressing by selecting Map type. Note: **none** disables compression. See the following section on Maps.
`show (adpcm_card-addr}`	Displays the status of the card, and the mapping.
`set {2:1:1-12} type data`	Set the channel (DS0) type to data on the ADPCM channels. See *set (ds0)* command for more information.
`set {2:4:1-12} type data`	Set the channel (DS0) type to data on the channels for cross-connect. See *set (ds0)* command for more information.
`connect 2:1:1-12 2:4:1-12`	Set cross-connects. The example connects all 24 channels of the ADPCM to the 12 channels of the T1 (now compressed) on port 4. Example is with **map2**
`show connect adpcm {2:1)`	Displays the connections made above.

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Cross-Connects

It is important to note that all timeslots are cross-connected in pairs. The actual pairs that can be cross-connected are dependant upon which of the 3 supported mappings are set using the *set (ds1 card) adpcm map* command.

Map1

- Channels 1-12 and 14-23 are compressed into 11 DS0s (2 to 1 compression)
- Channel 24 is used for 64K non-compressed data (mapped to channel 12)
- Channel 13 is idle (cannot be used)
- Channel pairing is as follows:
  1/2, 3/4, 5/6, 7/8, 9/10, 11/12, 14/15, 16/17, 18/19, 20/21, 22/23 (mapped to channels 1-11)
  Note: 13 and 24 are not included in the pairing. See above bullets.

Map2

- Channels 1-24 are compressed into 12 DS0s (2 to 1 compression)
- Channel pairing is as follows:
  1/2, 3/4, 5/6, 7/8, 9/10, 11/12, 13/14, 15/16, 17/18, 19/20, 21/22, 23/24 (mapped to channels 1-12)

Map 3

- Channels 1-22 are compressed into 11 DS0s (2 to 1 compression)
- Channel 24 is used for 64K non-compressed data (mapped to channel 12)
- Channel 23 is idle (cannot be used)
- Channel pairing is as follows:
  1/2, 3/4, 5/6, 7/8, 9/10, 11/12, 13/14, 15/16, 17/18, 19/20, 21/22 (mapped to channels 1-11)
  Note: 23 and 24 are not included in the pairing. See above bullets.

Example: **`connect 2:1:1 2:4:1`**
The above example will connect the ADPCM pair 1 (which are actually channels 1 and 2) to channel 1 (now compressed) on port 4.

Example: **`connect 2:1:1-12 2:4:1-12`**
With Map 1, the example will connect the ADPCM pairs 1-11 (which is actually channels 1-23 - no 12) to channels 1-11 (now compressed) on port 4 and channel 24 (12) to channel 12 (non-compressed data).

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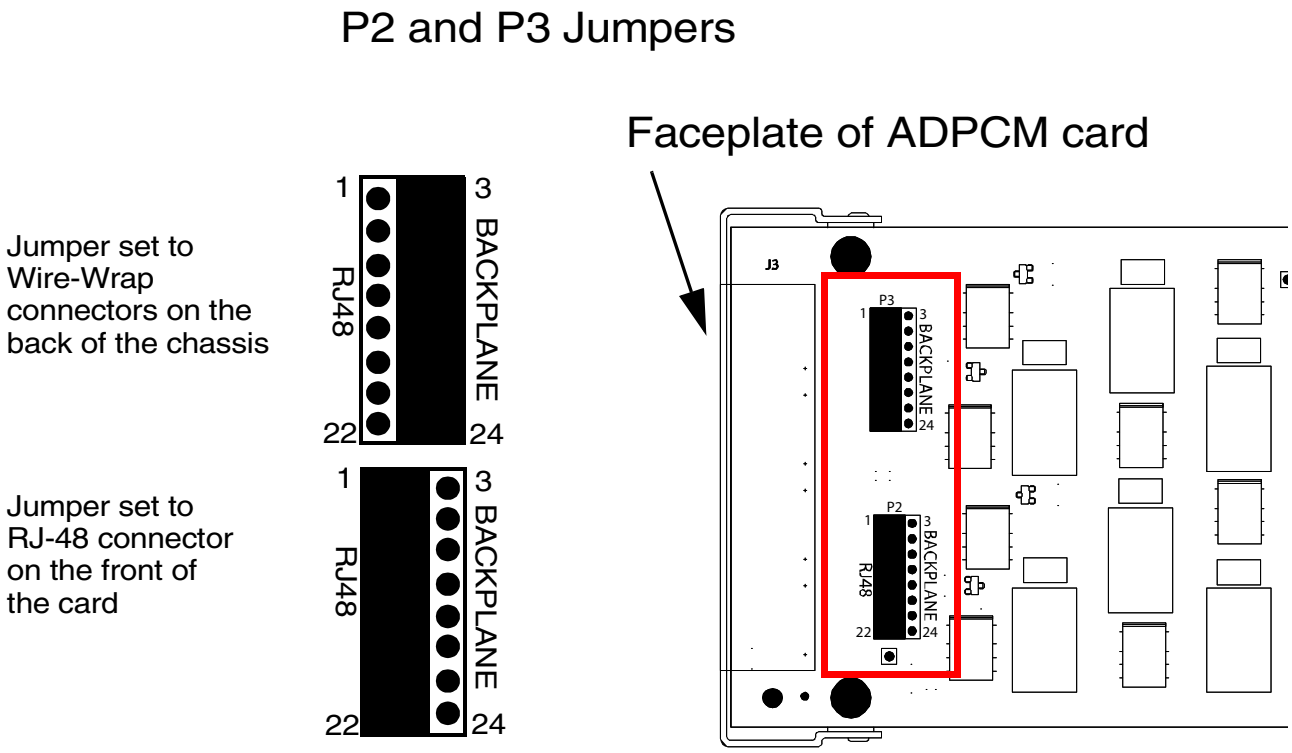
Jumper Settings

The P2 and P3 Jumpers are defaulted to RJ-48, which are the set of pins nearest the connectors. In this position the DS1 signals (TX and RX) are routed to the RJ-48 connectors on the face of the card, see *RJ-48 Connector on page 13-11* for pinout information. To route the DS1 signals to the wire-wrap connector at the rear of the unit, move all the jumpers to the "backplane" position (the two rightmost pins for each signal). See *Slot (1-8) Wire-Wrap Connectors on page 3-12* for more information on these connectors.



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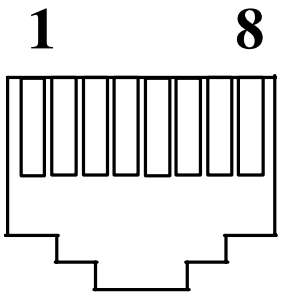
Connector Pinouts

RJ-48 Connector

There are four RJ-48 (female) connectors on the front of the Quad DS1 ADPCM Card.



The pinouts are as follows:

Pin	Name	Description
1	Receive Ring	Receive from DS1 network
2	Receive Tip	Receive from DS1 network
3	n/c	Not connected
4	Transmit Ring	To DS1 network
5	Transmit Tip	To DS1 network
6 - 7	n/c	Not connected
8	Chassis Ground	

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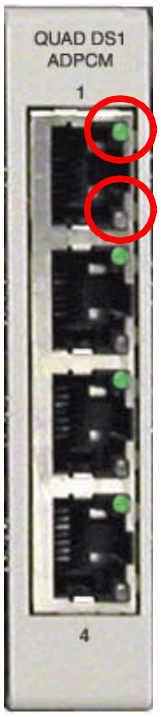
LEDs

Each channel on the Quad DS1 ADPCM card has two LEDs. The description of the top LED is shown below, the bottom LED is not used with this application.



Top LED (active)

Bottom LED (not used)

State	Description
Off	Off line
Green	Normal
Red	Loss of Signal (LOS)
Yellow	Bipolar Violation (BPV)
Flashing Green	Loopback active
Flashing Yellow	Yellow Alarm (Remote Alarm Indication)
Flashing Red (Slow)	Loss of Frame (LOF) or Alarm Indication Signal (AIS)
Flashing Red (Fast)	Self-test Failure

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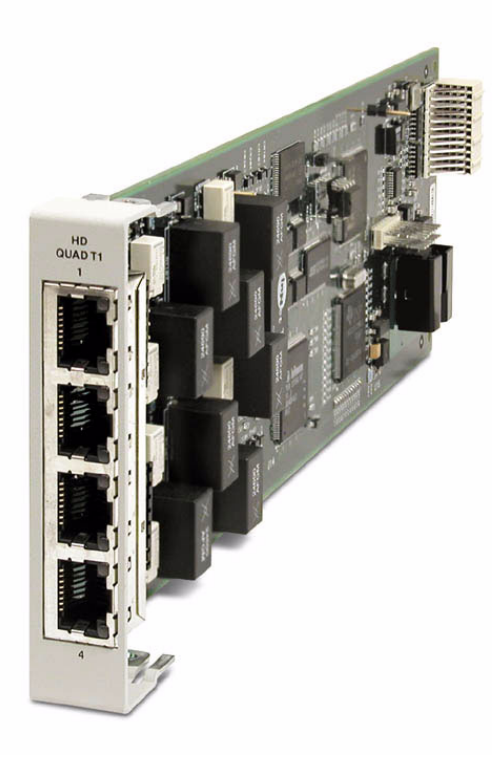
CHAPTER 14

Quad T1 & Quad DS1/E1 Card



In this Chapter

- Overview
- Features
- Technical Specifications
- Card Configuration
  - CLI Commands
- Jumper Settings
- Connector Pinouts
  - RJ-48 Connector
- LEDs

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Overview

The Hardened Quad T1 and DS1/E1 Service cards enable wireless service providers to cost-effectively provision and expand network bandwidth and groom available DS0s onto other T1 tributaries for optimal T1 bandwidth utilization. The card can be inserted into any slot of the eight-slot Axxius 800 and is software selectable for DS1 or DSX operation. It provide full 1/0 cross-connect capability, drop-and-insert functionality and supports fractional and full T1 services, as well as DS0 trunking. This service card has been specifically hardened to stand up to the extreme environmental conditions commonly associated with wireless cell site deployments.

NOTE: The E1 functionality of this card is not currently supported on the Axxius platform.

When fully equipped with eight Quad T1 Service cards plus the four-port DS1 Controller, an Axxius 800 can support up to 36 T1 ports. This available bandwidth enables the Axxius to cost-effectively address fixed-wireless service distribution, mobile wireless backhaul and daisy-chained DS0 distribution to remote cell sites. The flexible T1 Service card features four front-panel 8-pin RJ-48C shielded connectors.

The T1 Service card can be locally or remotely managed as a component of the Axxius 800 platform. The card can be configured using a Command Line Interface (CLI).

Hardened Quad DS1/E1 Service card

This card is configurable to DS1 or E1 (E1 will be supported in the future) with a single CLI command, regardless of Controller type.

Hardened Quad T1 Service card

The Hardened Quad T1 Service card enables cost-effective provisioning and expansion of T1 bandwidth with full non-blocking digital cross-connection of all timeslots to any Adit service card.

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Features

- Integrated T1 CSU functionality with FCC registration for direct connection to T1 lines
- B8ZS or AMI encoding and SF (D4) or ESF framing
- Local, line and payload loopbacks
- Framing and coding conversion between T1 ports
- Flexible system clock timing, which may be derived from or provided to any T1
- Up to eight Quad T1 Service cards plus the four ports from the DS1 Controller in a single Axxius 800 for a total of 36 DS1s/CSUs per chassis
- Full non-blocking Digital Cross-connection System (DCS) of all timeslots to any Axxius Service card
- ESF performance reporting
- Payload and line loopback
- Secondary solid-state fuseless protection to lightning and AC power cross incidents

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Technical Specifications

Controller Software Required

- Release 1.0 or higher is required for the Quad T1service card

T1 Interface

- 4 T1 ports operating at 1.544 Mbps (DS1) or 2.048 Mbps (E1) ±50 bps
- Expansion to 36 T1 ports in a single chassis using Quad T1 Service cards
- SF (D4) or ESF framing, AMI or B8ZS line coding
- Short-haul or long-haul loop settings for T1
- 4 RJ-48C front interface access (Control Panel Interface card) or rear wire-wrap pins (selectable)
- T1 Line Interface: T1-CSU or T1-DSX (field selectable)
- Line Build Out (DSX-1): 655 feet
- Receive Sensitive (DS1): 0 to -22 dB @ 772KHz ALBO
- Output Level (DS1): Selectable at 0 to -22 dB
- Jitter: Meets AT&T Pub. TR 62411
- Solid-state fuseless overvoltage and overcurrent T1 line protection
- Channel status LEDs
- Less than 3 ms signaling latency
- Less than 10 ms overall Axxius 800 system signaling latency

Network Standards

- RFC 2495
- ANSI T1.403-1995, T1.231-1993
- AT&T TR 62411, TR 54016
- ITU G.703, G.706, G.823, I.431
- TBR 12 and 13

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Clocking

- Loop-timed from any T1
- External from BITS clock input (t1.101, t1.102 signal type)
- Revertive or non-revertive (provisionable clock switching provides automatic backup to secondary T1 should the primary T1 fail
- Operates as a Stratum 4E device as defined by Telcordia GR-1244-CORE and AT&T TR 62411

Alarms

- Support standard T1.403 alarms
- LOS (Loss of Signal), Red, Yellow, Blue
- ESF Performance Error Count Threshold
- Timing Loss
- All alarms are logged in an event log
- Loss of power triggers minor alarm
- Generates SNMP traps for alarming

Testing and Diagnostics

- T1.403 payload loopbacks (ESF only)
- T1.403 remote and local line loopbacks (ESF and SF)
- T1.231 Performance History (15 minute intervals, 24 hour totals)
- T1.403 Performance Report Messages (PRMs)

Power Consumption

- Less than 4.5 W per card

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Environment

In addition to the systems environment requirements, the following applies to the Quad T1 (hardened) card. For additional information see *Installation Environment on page 2-3*.

- Operating temperature range of the Quad T1 card: -40° to 149° F (-40° to 65° C)

Physical

- Dimensions: 3.5 in. (H) x 0.75 in. (W) x 11.25 in. (D)
  8.9 cm (H) x 1.9 cm (W) x 28.6 cm (D)
- Weight: 5.1 oz. (0.14 kg)

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Card Configuration

All options on the this card are set using the Command Line Interface (CLI).

CLI Commands

The following commands are used to configure the Quad T1 card. For detailed information on these commands, see *Chapter 5, CLI Commands.*

- *connect*
  Creates two-way connections between channels.
- *disconnect*
  Removes a connection created by the connect command.
- *set (ds1)*
  Sets up the DS1 interfaces
- *set lsbackup*
  Defines the backup protection slot.
- *set lsprotect enable/disable*
  Enables or disables the Low Speed Protection options on the system.
- *set lsprotect manual*
  Sets the manual mode control for protected ports.
- *set lsprotect nonrevertive*
  Defines the port non-revertive status and priority level.
- *set lsprotect remove*
  Removes port from protected mode.
- *set lsprotect revertive*
  Defines the port revertive status and priority level.
- *show lsprotect*
  Displays the low speed protection settings.
- *show (ds1)*
  Displays current settings for DS1
- *status (ds1)*
  Displays the status of the DS1 (receive, transmit, loopback)
- *status lsprotect*
  Displays the current status of the low speed protection cards.

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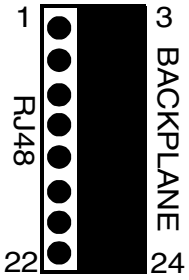
Jumper Settings

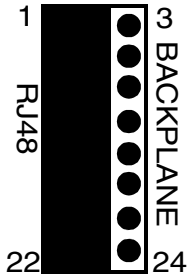
The P2 and P3 Jumpers are defaulted to RJ-48, which are the set of pins nearest the connectors. In this position the DS1 signals (TX and RX) are routed to the RJ-48 connectors on the face of the card, see *RJ-48 Connector on page 14-9* for pinout information. To route the DS1 signals to the wire-wrap connector at the rear of the unit, move all the jumpers to the "backplane" position (the two rightmost pins for each signal). See *Slot (1-8) Wire-Wrap Connectors on page 3-12* for more information on these connectors.

P2 and P3 Jumpers

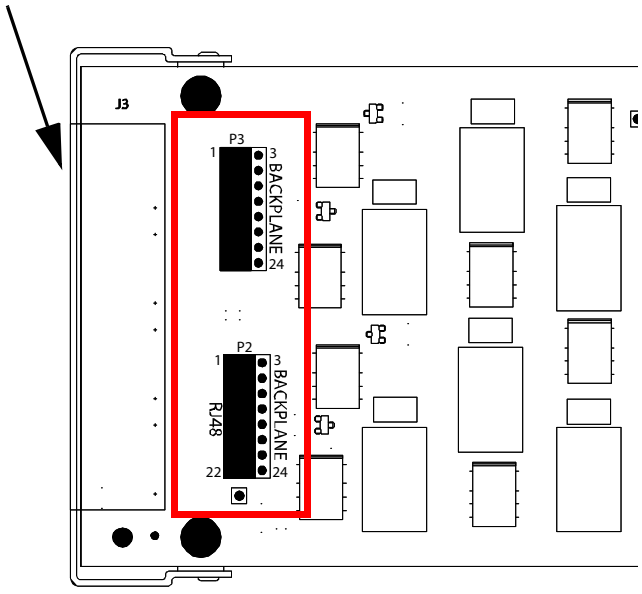
Jumper set to Wire-Wrap connectors on the back of the chassis



Jumper set to RJ-48 connector on the front of the card



Faceplate of T1 Card



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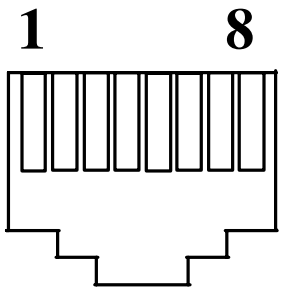
Connector Pinouts

RJ-48 Connector

There are four RJ-48 (female) connectors on the front of the Quad T1 and DS1/E1 Cards.



The pinouts are as follows:

Pin	Name	Description
1	Receive Ring	Receive from DS1 network
2	Receive Tip	Receive from DS1 network
3	n/c +	Not connected
4	Transmit Ring	To DS1 network
5	Transmit Tip	To DS1 network
6 - 7	n/c	Not connected
8	Chassis Ground	

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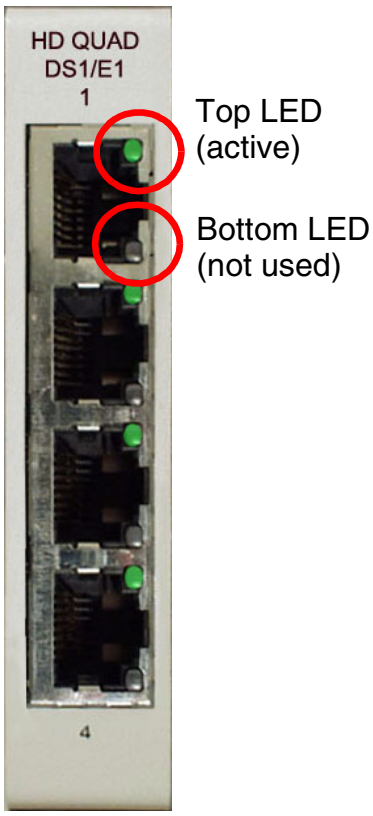
LEDs

Each channel on the card has two LEDs. The description of the top LED is shown below, the bottom LED is not used with this application.



State	Description
Off	Off line
Green	Normal
Red	Loss of Signal (LOS)
Yellow	Bipolar Violation (BPV)
Flashing Green	Loopback active
Flashing Yellow	Yellow Alarm (Remote Alarm Indication)
Flashing Red (Slow)	Loss of Frame (LOF) or Alarm Indication Signal (AIS)
Flashing Red (Fast)	Self-test Failure

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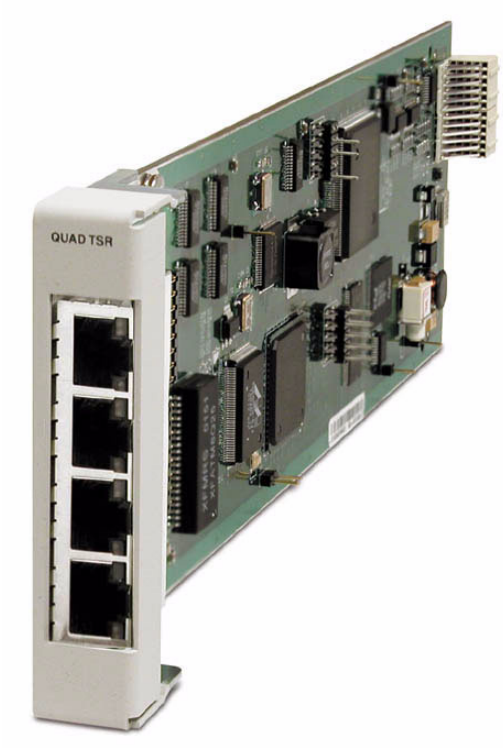
CHAPTER 15

Terminal Server Router Card



In this Chapter

- Overview
- Features
- Technical Specifications
- Card Configuration
  - CLI Commands
- Connector Pinout
- LEDs

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Overview

The Quad-Port Terminal Server Router (TSR) card combines the performance and expand ability of a selectable four-port RS-232 and 10/100Base-TX Ethernet switch with dedicated routing functionality in a low-cost solution to help wireless service providers remotely manage cell site LMU and switching devices, and deliver routing capabilities needed to offer 3G applications services. The ability to remotely manage these cell site devices significantly reduces maintenance truck rolls costs, and enables the wireless service provider to focus their efforts on expanding their cell site coverage for increased revenues.

The TSR card employs a dedicated processor to ensure high performance and product feature expansion. A powerful set of standard features includes IP and IPX routing, Layer 2 bridging, ML-PPP, networking security and management capabilities to integrate services in the digital last mile. The four RJ-45 ports can be configured as either RS-232 or 10/100Base-TX Ethernet connections to support remote device management from the Network Operations Center (NOC) or 3G routed data applications services. The Axxius 800's modular design supports up to eight TSR cards.

The TSR card is SNMP or Command Line Interface (CLI) manageable. Management connectivity is provided either by directly through the user data port connection on the TSR card, or through the DS1 or DS3 Controller cards as a component of the Axxius 800 platform.

Quad TSR with TBOS

The Quad-Port Terminal Server Router (TSR) card with TBOS-to-SNMP conversion, offers a fully integrated solution to convert and transport TBOS alarms. The TBOS data received on the TSR card's RS-232 ports are stored and made available via SNMP GETs. Alarms from TBOS-monitored equipment are converted to SNMP traps and transported over the WAN DS0 to the Network Operation Center's SNMP Trap Manager. This eliminates the need for a separate TBOS alarm monitoring system for fixed microwave backhaul systems and reduces bandwidth expense. Up to 8 TBOS devices can be cascaded off a single TSR RS-232 port.

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Features

- Enables remote management of cell site resources
- Supplies 4 selectable RS-232 synchronous or 10/100Base-TX Ethernet connections per card
- Supports up to 8 Router cards per Axxius 800 chassis
  - Multi-point networking with up to 24 WAN connections per router
  - Each WAN connection can be provisioned with multiple DS0s
  - Deliver more than 2 T1s bandwidth per Router card; up to 60 DS0s per Router card
- Ensures high performance and feature expansion
- Enables management via menu-driven or CLI Router interface
- Supports packet filtering and Spanning Tree Protocol
- Allows network address and port translation (NAT, PAT)
- Enables multiple T1 facilities to function as a single IP WAN interface using ML-PPP for bandwidth scalability beyond a single T1
- Supports Dynamic Host Configuration Protocol (DHCP)
- Delivers 3,700 packets per second throughput (64 byte packets)

Additional Features on a TSR Card with TBOS

- Decodes the TBOS protocol to recover the individual alarm data points
- SNMP traps based upon changes to monitored alarm conditions
- Supports SNMP traps and GETs for the monitored alarm data
- Daisy chain up to 8 TBOS displays off 1 TSR RS-232 port

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Technical Specifications

Controller Software Required

- Release 1.0 or higher is required for the TSR service card
- Release 2.0 or higher to support a TSR Service card with TBOS
- TSR release 1.2 or higher to support all features listed in this chapter

Management

- CLI driven via RS-232 or Ethernet
- Menu-driven via RS-232 or Ethernet, see the Terminal Server Router User Manual for information on the Menu-driven software
- SNMP
- Ping, Trace Route
- Ethernet management port
- IP management DS0 bearer channel
- Code download via TFTP
- Configuration upload and download via TFTP

WAN Interface

- Any DS1 or DS3 interface on the Axxius 800 platform
- Up to 24 WAN interfaces per Router
- Up to 60 DS0s bandwidth per Router
- PPP, Frame Relay, PPP in Frame Relay and GRE tunneling

LAN Interface

- A single 10/100Base-TX auto-sensing port/auto-MDIX ports
- 8-pin RJ-45 modular jacks

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RS-232 Interface

- Up to 4 RS-232 DCE ports
- Selectable asynchronous data rates and data parameters
- 8-pin RJ-45 modular jacks
- RJ-45-to-DB9 adapter cable available

Routing

- IPX RIP/SAP
- IP RIPv1, RIPv2, RIPv/RIPv2 compatibility mode
- Static routing
- Classless routing (CIDR)

Bridging

- IEEE 802.1D MAC bridging, using the Spanning Tree Algorithm and Protocol

Router Performance

- Minimum of 3,000 64-byte packets per second throughput

Advanced Capabilities

- DHCP server, BOOTP Relay
- SysLog
- Domain Name Server (DNS) proxy
- DNS resolver
- Simple Network Time Protocol (SNTP) support for timing from a separate network server
- Secondary IP Address
- RS-232 terminal server
- RS-232 TBOS support: RS-422 TBOS support can be provided using an external RS-232 to RS-422 converter

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Frame Relay

- RFC 1490 encapsulation
- ANSI T1.617 Annex D LMI
- ITU Q.933 Annex A LMI

Filtering

- Filtering up to Layer 4, stateful

Security

- Three user accounts
- Three levels of security
- PAP and CHAP
- Network Address Translation (NAT)
- NAT Bypass
- Port Address Translation (PAT)

MIBs

- RFC 1212 (Concise MIB)
- RFC 1213 (MIB II)
- RFC 1406 (DS1/E1)
- RFC 1471 (LCP/PPP)
- RFC 1473 (IP/PPP)
- RFC 1643 (Ethernet)
- RFC 1659 (RS-232)
- RFC 2011 (IP)
- RFC 2115 (Frame Relay)
- RFC 2233 (Interface)
- Enterprise MIB, including equipment-specific MIBs to support GET operation on TBOS-monitored equipment

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Equipment Supported for TBOS-to-SNMP Conversion

- Proxim Lynx.sc Microwave Radio Models 31250, 31600, 31250, 31650
- Proxim Lynx.HD Microwave Radio Models 31350-10, 31850-10, 31145-10, 31145-F
- Proxim Lynx DS-3 Microwave Radio Models 27710-91, 27750-91
- Proxim Lynx Hot Standby Protection Switch Models 31455, 31420
- Alcatel MDR-4000 Microwave Digital Radio

Testing and Diagnostics

- Ping, Trace Route
- WAN monitor

Power

- Less than 5 W

Environment

In addition to the systems environment requirements, the following applies to the Terminal Server Router card. For additional information see *Installation Environment on page 2-3.*

- Operating temperature range of the TSR card: -40° to 149° F (-40° to 65° C)

Physical

- Dimensions: 3.5 in. (H) x 0.75 in. (W) x 11.25 in. (D)
  8.9 cm (H) x 1.9 cm (W) x 28.6 cm (D)
- Weight: 5.2 oz. (0.15 kg)

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Card Configuration

The Terminal Server Router card has the option of configuration through CLI or the TSR Menu-driven software, which is accessed through Telnet. The following CLI commands are all TSR related. For information on the TSR Menu-driven software, see the Terminal Server Router User Manual.

NOTE: With this release TBOS features are set with the TSR Menu-driven software. See the Terminal Server Router User Manual for more information.

CLI Commands

Many of the router features can be configured directly with CLI commands. For configuration of features not covered with CLI commands, the operator must use the TSR Menu-driven software. For detailed information on the following TSR commands, see Chapter 5, CLI Commands.

- *add (router) dhcp server option*
  Enable add optional DHCP server attributes every time a DHCP client discovery is initiated.
- *add (router) dns proxy*
  Enable DNS proxy and add a remote DNS server address to the TSR card.
- *add (router) remote*
  Add a remote WAN profile to the WAN profile table.
- *add (router) snmp community*
  Add a SNMP community to an interface on the TSR card.
- *add (router) snmp trap*
  To specify a destination to send SNMP trap messages.
- *add (router) static dns host*
  Add a static DNS host record for resolving a domain name to an IP address if the DNS server cannot provide the information.
- *add (router) uploaduser*
  To specify a host that is allowed to upload configuration/software files.

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- *add (router-lan) filter*
  Add an address filter to the table of Layer 2 filter applied specified LAN interface.
- *add (router-lan) secondary ip address*
  Add a secondary IP address and subnet to the LAN interface.
- *add (router-lan) static*
  Add a static element on the specified LAN.
- *add (router-wan) firewall*
  Add a firewall rule to a WAN.
- *add (router-wan) gre network*
  Add a "by network" GRE tunnel to a WAN.
- *add (router-wan) static*
  Add a static IP address to the table of learned addresses on the WAN interface. This command is typically used in bridging.
- *clear (router) ip address table*
  Flush the learned entries from the IP address table for the specific interface from the specified TSR card.
- *clear (router) mac address table*
  Flush the learned entries from the MAC address table for the specific interface from the specified TSR card.
- *connect (router-trunk) (t1)*
  Creates two-way connections between the router port trunk connections and any DS0 channels of the service card or controller.
- *delete (router) dhcp server option*
  Remove optional DHCP server attributes.
- *delete (router) dns proxy*
  Remove a remote DNS server address from the specified TSR card.
- *delete (router) remote*
  Delete a remote WAN profile from the WAN profile table.
- *delete (router) snmp community*
  Delete an SNMP community entry.
- *delete (router) snmp trap*
  Delete a trap destination from the TSR card.

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- *delete (router) static dns host*
  Delete a static DNS host record.
- *delete (router) uploaduser*
  Remove an existing authorized uploaduser.
- *delete (router-lan) filter*
  Remove a a single filter rule from the table of Layer 2 filters applied to the specified LAN interface.
- *delete (router-lan) secondary ip address*
  Delete a secondary IP address from the LAN interface.
- *delete (router-lan) static*
  Remove a static element from the LAN interface.
- *delete (router-wan) firewall*
  Remove a firewall rule from a WAN.
- *delete (router-wan) gre network*
  Remove a "by network" GRE tunnel to a WAN.
- *delete (router-wan) static*
  Delete a static element from the WAN interface.
- *disconnect {slot:port:trunk}*
  Removes a connection created by the connect {trunk-addr}{t1-addr}
- *install (slot) router*
  Will prepare the controller for the insertion of a new router card that will keep its currently loaded configuration.
- *load tftp*
  Will download software via TFTP to the Controller or the TSR card.

WARNING! BEFORE LOADING A DOWN-LEVEL OF ROUTER CODE TO AN ADIT, SAVE THE CONFIGURATION TO A FILE. CONFIGURATION MAY BE RESET TO THE DEFAULT SETTING AND CURRENT CONFIGURATION LOST.

- *rename (router) (router-wan/lan)*
  Change the name of a remote WAN or local LAN profile on the TSR card.

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- *reset (router)*
  Reboot the Router. All new configuration since the last configuration will be in-use.
- *set (router) default*
  Reset the router to its default configuration settings, and will reboot.
- *set (router) dhcp*
  Configure the DHCP functions.
- *set (router) dns*
  Set the Domain Name Server options.
- *set (router) enhanced security*
  Enable the enhanced logging security on the Router.
- *set (router) lmi*
  Specify the Local Management Interface (LMI) protocol to use for the Router.
- *set (router) login auth*
  Define the login authentication type.
- *set (router) login prompt*
  Enable and disable the login prompt.
- *set (router) ntp*
  Set the Network Time Protocol parameters.
- *set (router) password*
  Manage password access on the router.
- *set (router) port*
  Set port characteristics on a Terminal Server Router card.
- *set (router) ppp auth*
  Configure the Point-to-Point Protocol authentication on the router card.
- *set (router) ppp security*
  Set up the local external security server that the router will use to authenticate remote PPP devices.
- *set (router) proxy*
  Configures Router in-use basics (up, down and proxy).

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- *set (router) reboot*
  Set automatic reboot after an upload of code or configuration file.
- *set (router) rip*
  Specify version of RIP packets to transmit and receive.
- *set (router) snmp*
  Set the SNMP contact, location, name on the router.
- *set (router) stp*
  Set the Spanning Tree Protocol on the router (card).
- *set (router) syslog*
  Set the router to send alarm and event messages to a Syslog server.
- *set (router-lan) filter forward*
  Set the forwarding mode for Layer 2 filters on the LAN interface.
- *set (router-lan) gateway*
  Specify a default IP gateway for the specified LAN interface.
- *set (router-lan) ip address*
  Specify an IP address for the specified LAN interface.
- *set (router-lan) ipx network*
  Specify an IPX address for the specified LAN interface.
- *set (router-lan) phy*
  Specify the Ethernet PHY (physical specifications) speed and mode.
- *set (router-lan) rip*
  Specify IP RIP for the LAN interface.
- *set (router-lan) stp*
  Specify the Spanning Tree Protocol on the LAN interface.
- *set (router-lan) up/down*
  Set the LAN interface up or down.
- *set (router-trunk) encapsulation*
  Specify the encapsulation to use on the TSR interface.
- *set (router-trunk) multilink group*
  Specify a router trunk to be part of a multilink PPP group.
- *set (router-trunk) up/down*
  Set the TSR trunk up or down.

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- *set (router-wan) dlci*
  Configure the DLCI for a specified WAN interface that will be using a frame relay encapsulated trunk.
- *set (router-wan) gre*
  Configure the Generic Routing Encapsulation tunneling for a specified WAN interface.
- *set (router-wan) ip*
  Set the IP traffic handling on the WAN interface.
- *set (router-wan) ip address*
  Set the IP address for a WAN interface.
- *set (router-wan) ipx*
  Set the IPX traffic handling on the WAN interface.
- *set (router-wan) nat*
  Configure Network Address Translation (NAT) on a specified WAN interface.
- *set (router-wan) other*
  Set the traffic handling of protocols other than IP or IPX on the specified WAN interface.
- *set (router-wan) ppp*
  Configure the Point-to-Point Protocol on the specified WAN interface.
- *set (router-wan) rip*
  Set the type or RIP updates on the WAN interface.
- *set (router-wan) stp*
  Configure the trunk port for a specified WAN interface.
- *set (router-wan) trunk*
  Configure the trunk port or multilink group for a specified WAN interface.
- *set (router-wan) up/down*
  Set the specified WAN interface up or down.
- *show (router)*
  Displays the current TSR settings.
- *show (router) dhcp*
  Displays the current DHCP settings for the TSR card.

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- *show (router) dns*
  Displays the current DNS settings for the TSR card.
- *show (router) dns proxy*
  Displays the current DNS Proxy settings for the TSR card.
- *show (router) lmi*
  Displays the current Local Management Interface settings for the router card.
- *show (router) login*
  Displays the current Local Management Interface (LMI) settings for the router card.
- *show (router) login*
  Displays the current Local Management Interface (LMI) settings for the router card.
- *show (router) ntp*
  Displays the current NTP settings for the router card.
- *show (router) port*
  Displays the current TSR port configuration.
- *show (router) ppp*
  Displays the current Local PPP authentication and security settings for the router card.
- *show (router) rip*
  Displays the current RIP settings for the router card.
- *show (router) snmp*
  Displays the current SNMP settings for the router card.
- *show (router) stp*
  Displays the current Spanning Tree Protocol settings for the router card.
- *show (router) syslog*
  Displays the current Syslog setup settings for the router card.
- *show (router) uploaduser*
  Displays the current list of users allowed to upload and download configuration and code files.
- *show (router-lan)*
  Displays the current LAN settings for the router card.

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- *show (router-lan) filter*
  Displays the current LAN Layer 2 data filters applied to the LAN on the router card.
- *show (router-lan) static*
  Displays the current list of static entries for the LAN on the router card.
- *show (router-lan) stp*
  Displays the current Spanning Tree Protocol settings for the specified LAN interface.
- *show (router-wan)*
  Displays the current configuration for the specified WAN.
- *show (router-wan) firewall*
  Displays the current firewall filter settings for the specified WAN interface.
- *show (router-wan) ppp*
  Displays the current PPP settings for the specified WAN interface.
- *show (router-wan) static ip address*
  Displays the current list of static IP address entries for the specified WAN interface.
- *show (router-wan) static ip network*
  Displays the current list of static IP network entries for the specified WAN interface.
- *show (router-wan) static mac address*
  Displays the current list of static IP MAC address entries for the specified WAN interface.
- *show (router-wan) stp*
  Displays the current Spanning Tree Protocol settings for the specified WAN interface.
- *show (router-wan) trunk*
  Displays the current trunk assignments for the specified WAN interface.
- *status (router)*
  Displays the current Router status information (alarms, DNS, events, IP address table, IP network table, IPX network table, IPX server table, MAC address table, performance, STP).
- *status (router-lan)*
  Displays the current router status information.

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- *status (router-trunk)*
  Displays the current state of the DNS resolver and the entries in the DNS cache.
- *store*
  Save a software file from a slot to a defined location on a PC, via TFTP.
- *telnet (router)*
  Establish a Telnet session from the Axxius 800 CLI to the router port user interface.

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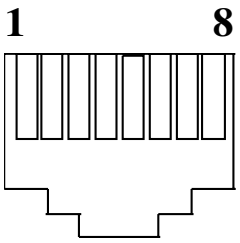
Connector Pinout

10Base-T Ethernet



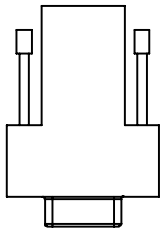
The pinout for the RJ-48C (female) connectors on the front of the card are as follows:

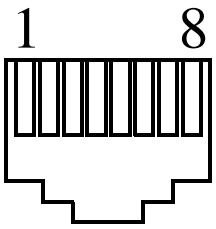
Pin	Name	Description
1	Receive +	Receive from network
2	Receive -	Receive from network
3	Transmit +	Transmit to network
4 - 5	N/C	Not connected
6	Transmit -	Transmit to network
7 - 8	N/C	Not connected

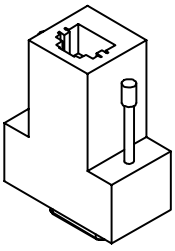
RS-232

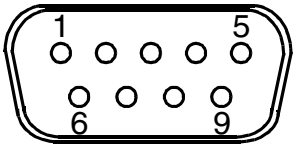
If the card is set to use the RS-232 connector (with jumpers) use the above RS-232 pinouts. There is a RS-232 to DB-9 converter cable available, P/N 005-0106.

The pinout is as follows:









RJ-45	DB-9	RS-232
1	8	CTS (Input)
2	7	RTS (Output)
3	6	DSR (Input)
4	3	TXD (Output)
5	2	RXD (Input)
6	1	DCD (Input)
7	4	DTR (Output)
8	5	SG (Filtered)
NA	9	RI (Not Used)

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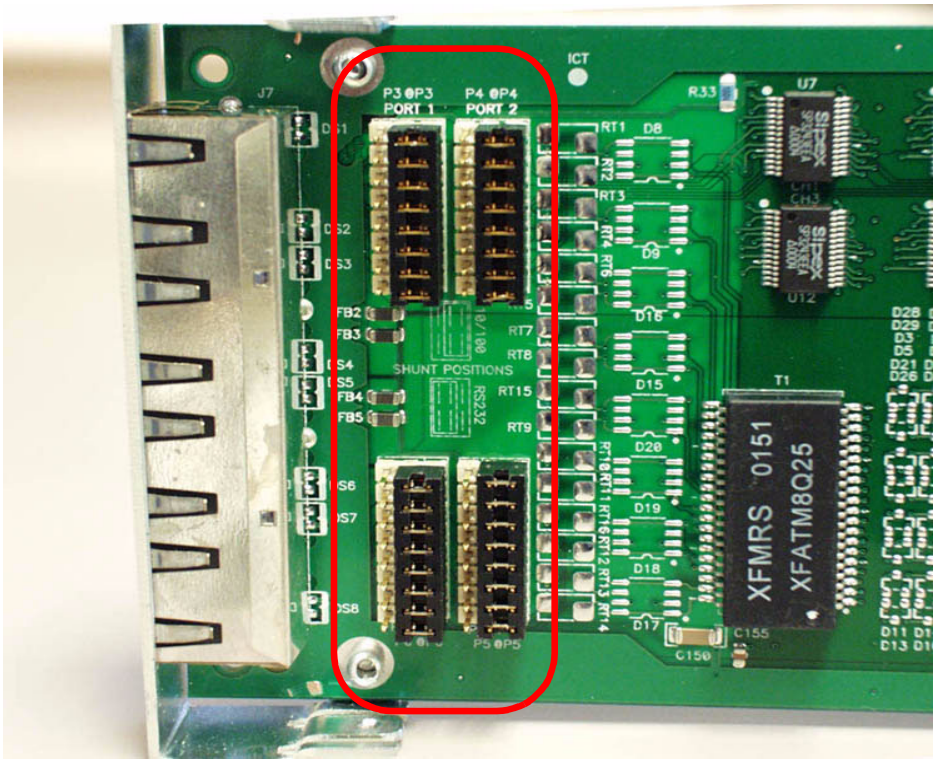
TSR Card Jumpers

The jumpers on the TSR card select the use of the 10/100Base-T (RJ-45) or RS-232. There is one jumper for each port on the card. Each jumper can be set to 10/100Base-T or RS-232, independent of the others.

Connector	Placement
10/100Base-T	Position is farthest away from the front of the card
RS-232	Position closest to the front of the card

In the following graphic all port jumpers are set to 10/100Base-T Ethernet.

Card Front



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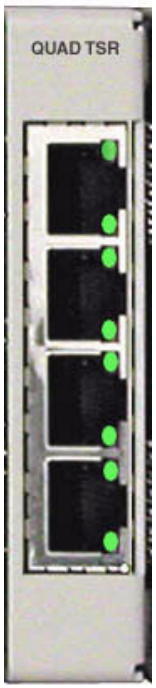
LEDs

The TSR service card has 2 LEDs per port.



At Power-up

TOP LED	Bottom LED	Description
Off	Off	Loss of power
Red	Red	Card is inoperative
Flashing Red	Flashing Red	Self-test or Boot in-process

Normal Operation

TOP LED	Bottom LED	Description
Green Solid (Link)	Green Solid (Link)	Port set for Ethernet - see below
Flashing Red	Flashing Red	Self-test or Boot in-process

Port Set for Ethernet

Top LED indicates 100M Link, Bottom LED indicates 10M Link

State	Description
Off	No Ethernet link
Green	Link but no activity
Red Flashing	Current Ethernet collision
Green Flashing	Current Ethernet receive
Yellow Flashing	Current Ethernet transmit

Port Set for RS-232

TOP LED	Bottom LED	Description
Yellow	Flashing Yellow	Current transmit
Yellow	Flashing Green	Current receive
Yellow	Off	No Activity

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CHAPTER 16

V.35/.54 Card

In this Chapter

- Overview
- Features
- Technical Specifications
- Card Configuration
  - CLI Commands
- Cables
- Connector Pinouts
  - V.35 DCE (DB-26)
- LEDs

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Overview

The Hardened Dual V.35/.54 Service card enables wireless service providers to provision connectivity to high-speed serial synchronous Data Terminal Equipment (DTE) devices commonly deployed in the cell sites. V.35 service connections supporting frame relay or transparent bit streams can be configured over one or more T1 access lines to deliver DS0 bandwidths to wireless cell site devices such as CDPD, RFFP and data routing equipment. This service card has been specifically hardened to stand up to the extreme environmental conditions commonly associated with wireless cell site deployments.

The V.35/.54 Service card provides scalable high-speed data service capacity to grow as bandwidth requirements in the cell sites increase. Up to 8 V.35/.54 Service cards can be equipped in an Axxius 800 platform. Integrated digital cross-connect System (DCS) capability supports service grooming and full drop-and-insert functionality, features not available in traditional CSU/DSU offerings.

Each V.35 port supports any n x 56/64 Kbps rate up to 1.536 Mbps. Both ports may operate simultaneously at any supported speed. Flexible clocking options include loop timing from any T1 line and the ability to supply system clock to the connected DTE, allowing support for a wide range of data networking applications. Additionally, each V.35 port supports V.54 loopback pattern recognition, generation and timing control to troubleshoot service from the network or the end device to theV.35 electrical interface.

The V.35/.54 Service card can be locally or remotely managed as a component of the Axxius 800 platform. The card can be configured using a Command Line Interface (CLI) or via NetworkValet graphical interface.

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Features

- Each port provides any n x 56/ 64 Kbps data rate up to 1.536 Mbps on each port
- Full non-blocking cross-connection of all timeslots to any T1 access line
- Up to 16 V.35 ports may be equipped in a single Axxius 800 platform
- Supports adaptation and tansport over TDM facilities

Additional V.54 Features

- V.54 Loop Test capability

Technical Specifications

Controller Software Required

- Release 1.0 or higher is required for the V.35/54 service card

Service Interface

- Two V.35 interfaces:
  - Configured as DCE
  - Two sub-miniature DB-26 connectors
  - DB26 to V.35 adapter cables available

Network Interface

- T1 N x DS0, where N = 1-24

Clocking

- Looped-timed from any T1 card installed
- Sources clock to the DTE device

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Testing and Diagnostics (V.35/54 card)

- Addressable V.54 loop up and loop down (127-code) pattern generation/ detection
- 2047, 2^{15}-1, 2^{20}-1 and QRSS Test Patterns with error counter

Power

- 2 W maximum

Environment

In addition to the systems environment requirements, the following applies to the V.35/54 (hardened) card. For additional information see *Installation Environment on page 2-3.*

- Operating temperature range of the V.35/54 card: -40° to 149° F (-40° to 65° C)

Physical

- Dimensions: 3.5 in. (H) x 0.75 in. (W) x 11.25 in. (D)
  8.9 cm (H) x 1.9 cm (W) x 28.6 cm (D)
- Weight: 4.6 oz. (0.13 kg)

Accessories

Sub-miniature DB-26 to Winchester adapter cables are required to interface DTE with the Dual V.35 card. Gender refers to the Winchester connector. One cable per port.

- P/N 005-0008 V.35 Male 10 Ft. (3.05 m) cable
- P/N 005-0009 V.35 Male 25 Ft. (7.62 m) cable
- P/N 005-0010 V.35 Male 50 Ft. (15.24 m) cable
- P/N 005-0011 V.35 Female 10 Ft. (3.05 m) cable

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Card Configuration

The V.35/54 card can be configured, using the Command Line Interface (CLI).

CLI Commands

The following commands are used to configure the V.35 cards. For detailed information on these commands, see Chapter 5, CLI Commands.

- *connect*
  Creates two-way connections between channels.
- *disconnect*
  Removes a connection created by the connect command.
- *set (v35)*
  Setup of channels of a V.35 card (clock, clear to send, data, equipment, line, receive clock invert, speed, transmit clock invert).
- *set (v54)*
  Set the V.54 loopback test parameters.
- *show (v54)*
  Displays the current settings for V.54 (CTS, timing, Rx clock inversion, Tx clock inversion, data inversion, data speed, data rate, Rx LB, Rx Addr, test address, Tx Prep count, Rx Prep count, test pattern, ignore ACK, loopback)
- *status (v54)*
  Displays the current near-end line status of the specified V.54 (DCD, CTS, DSR, RTS, DTR, BERT).

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Cables

Depending on your application, you will need to purchase one or more of the available Carrier Access Corporation V.35 data cables:

Part Number	Description	Notes
005-0014	V.35 Female 10-foot cable	These cables are used to provide the V.35 DCE interface on a male connector to typical DTE applications. Order one cable per V.35 port.
005-0068	V.35 Female 25-foot cable	
005-0069	V.35 Female 50-foot cable	
005-0010	V.35 Male 50-foot cable	V.35 data cables with male connector for connecting a router with a female V.35 Winchester connector or other data equipment to a Adit 600 V.35 data port (sub-miniature DB-26). Order one cable per V.35 port.
005-0009	V.35 Male 25-foot cable	
005-0008	V.35 Male 10-foot cable	
005-0189	DB-25 V.35 Female 50-foot cable	These cables are used to provide a DB-25 DCE V.35 female interface for connection to a male DB-25 DTE V.35 interface. Order one per port.
005-0188	DB-25 V.35 Female 25-foot cable	
005-0187	DB-25 V.35 Female 10-foot cable	
005-0186	DB-25 V.35 Female 6-foot cable	

These cables can be purchased at a licensed Carrier Access distributor.

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Connector Pinouts

V.35 DCE (DB-26)

The V.35 DCE data port connection is made at the sub-miniature DB-26 connector on the Axxius 800 using the 10-foot, 25-foot, or 50 foot Carrier Access DTE V.35 cable equipped with a sub-miniature DB-26 connector and a 34-pin Winchester connector.

This cable is used to connect the Axxius 800 V.35 DCE data ports to synchronous V.35 DTE data sources up to 1.536 Mbps, all rates (1-24) Nx56 or Nx64 channel-rate progression.

The Carrier Access Corporation V.35 data cables are built according to the pin assignments listed below:

Sub-miniature DB-26	Signal	Winchester 34-pin (female)	Paired Signals
1 (+ Shield)	← Protective Ground →	A	⎡
7	← Signal Ground →	B	⎣
2	← Transmit Data A —	P	⎡
14	← Transmit Data B —	S	⎣
3	— Receive Data A →	R	⎡
16	— Receive Data B →	T	⎣
4	← RTS —	C	⎡
20	← DTR —	H	⎣
5	— CTS →	D	⎡
6	— DSR →	E	⎣
12	— Test Mode →	K	⎡
8	— CD (RLSD) →	F	⎣
11	← External Clock A —	U	⎡
24	← External Clock B —	W	⎣
10	— Xmit Clock A →	Y	⎡
23	— Xmit Clock B →	AA	⎣

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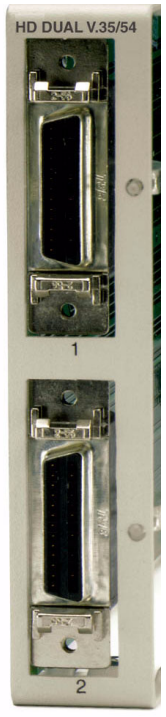
Sub-miniature DB-26	Signal	Winchester 34-pin (female)	Paired Signals
15	— Receive Clock A →	V	⎤
17	— Receive Clock B →	X	⎦
22	← Local Loopback —	J	⎤
25	← Remote Loopback —	BB	⎦
9, 13, 18	Open Pins/No Contact	L, N, NN	
19, 21, 26	Open Pins/No Contact		

LEDs

Each V.35 port has an LED, with definitions as shown in the table below.



State	Description
Off	No T1 Assignment
Green	Normal (CD/RTS) Active
Red	CD inactive (T1-side failure)
Yellow	RTS inactive (equipment-side failure)
Flashing Yellow	Loopback toward T1 or equipment loop test
Flashing Green	Loopback toward equipment or network loop test

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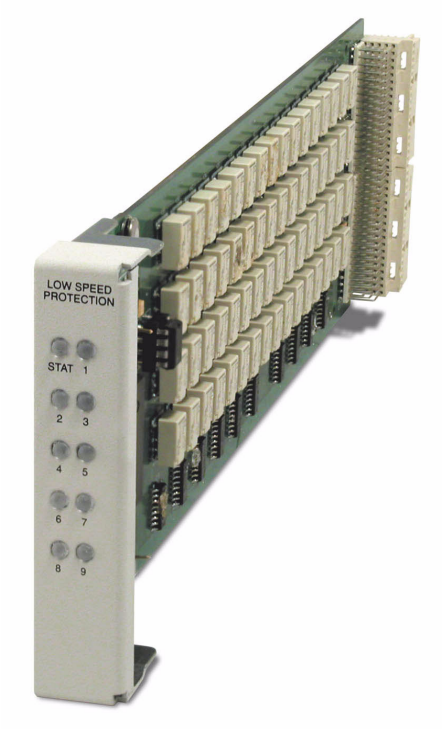
CHAPTER 17

Low Speed Protection Card



In this Chapter

- Overview
- Features
- Technical Specifications
- Card Configuration
  - CLI Commands
  - Basic Setup of a Protected System
- LEDs

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Overview

Low speed protection provides backup circuitry for any T1 service port on a Quad T1 service card or Quad DS1 ADPCM service card in the Axxius chassis. The Relay card provides the physical connectivity between the “Protected” T1 service port and the “Backup” T1 service port. Connectivity exists between the Service card and the Relay card via the backplane pins only.

The service card slot that is configured for the “Backup card” is specified using CLI commands. Additionally, the commands enable the user to specify what service card (T1 or DS1 ADPCM) is to be protected and which port(s) on that card are to be protected. In this manner, the protection card provides protection on an individual port basis as opposed to a per card basis. Therefore protection is available for multiple cards at the same time, as long as the port needing protection is not already being used by the Backup card. For example if a Quad T1 card, slot 1, port 1 requires protection, the Backup card port 1 is used to provide that protection. Ports 2-4 are still available for protection on the remaining protected service cards.

A protected system can contain both T1 and DS1 ADPCM service cards. However, the ADPCM mapping must be set the same on all cards in the protected system for Port #1 to be protected. Note: ports 2-4 are not effected by the ADPCM feature configuration. See the following chart:

	BACKUP CARD		
PROTECTED CARD	**T1 Service Card**	**DS1 ADPCM Card (ADPCM set to "none")**	**DS1 ADPCM Card (ADPCM set to "map1", "map2" or "map3")**
T1 Service Card	supported	supported	not supported
DS1 ADPCM Card (ADPCM set to "none")	supported	supported	not supported
DS1 ADPCM Card (ADPCM set to "map1", "map2" or "map3")	not supported	not supported	supported

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The Backup Card

A Quad T1 or Quad DS1 ADPCM service card can be configured as the “Backup card”. The Backup card provides T1 port protection for other installed T1 service cards, and can occupy any one of the eight service card slots.

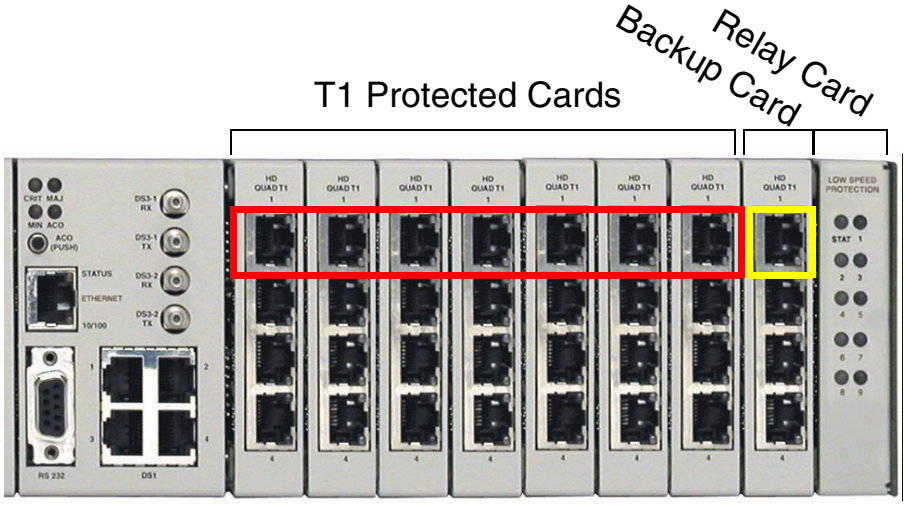
Note: It is imperative that the slot designated for the backup card have NO wire-wrap connections.

Protected Cards

The Quad T1/Quad DS1 ADPCM service cards to be protected can occupy any of the 7 remaining service card slots (backup card occupies the 8th slot). One or all four ports can be protected, though each series of ports (all 1s, 2s, 3s and port 4s) have one backup T1 port. The Axxius system can use other service cards in any of the 8 service card slots without interference with the Low Speed Protection system.

Port Backup and Prioritization:

Priorities can be set for these protected ports (1-7) where 1 is the highest priority and the default setting is 7. If more than 1 fault occurs at the same time the port with the higher priority is granted the protection. In cases where traffic from a lower priority port is already switched to backup, the traffic is forced back to the failed port to provide the higher priority traffic with the backup port. When port protection requests are set at the same level, protection is granted on a "first come, first serve" basis.



Above port #1 of the backup card provides a single T1 backup to all the protected T1’s, port #1 in the system. This scenario is the same for the Backup port #2, port #3, and port #4.

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Features

- Redundant 1:7 T1 interface protection
- Maintains service during card swaps
- Four T1 ports provide hot-standby backup for up to 28 T1 ports
- Any of the eight service slots can be designated as a Backup card slot
- Seven selectable protection priority levels
- Selectable 24-hour lockout feature
- Enables remote SNMP, or Telnet provisioning, monitoring and testing of services and network conditions

Technical Specifications

Controller Software and Hardware Required

- Controller software Release 1.2 or higher is required for the Low Speed Protection card
- Quad T1 Service cards (2 min.) requires Quad T1 Release 2.0 or higher
- Quad DS1 ADPCM Service cards (2 min.) Requires Controller Release 2.0 or higher

Protection Capacity

- 1:7 T1 ports

Switchover Criteria

- Active card removal
- Line code violation count
- Loss of Signal/Loss of Frame
- All zeros
- Internally shorted pair
- Active card power loss

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Service Cards Supported

- Quad T1 Service Card (hardened)
- DS1/E1 Service Card (hardened)
- Quad DS1 ADPCM Service Card (hardened)

Management

- RS-232/V.24 asynchronous craft port
- 10Base-T Ethernet management port
- Command Line Interface (CLI) from both the local asynchronous port and remote Telnet sessions
- Menu-driven configuration and management interfaces
- SNMP agent for use with SNMP-based Element Management Systems

Alarms

- Switchover to hot-standby card
- Switchback to normal

Power

- 2.5 W maximum

Environment

In addition to the systems environment requirements, the following applies to the Low-Speed Interface Protection Relay card. For additional information see *Installation Environment on page 2-3*.

- Operating temperature range of the card: -40° to 149° F (-40° to 65° C)

Physical

- Dimensions: 3.5 in. (H) x 0.75 in. (W) x 11.25 in. (D)
  8.9 cm (H) x 1.9 cm (W) x 28.6 cm (D)
- Weight: 7.4 oz. (0.21 kg)

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Card Configuration

CLI Commands

The following commands are used to configure the Low Speed Protection cards. For detailed information on these commands, see *Chapter 5, CLI Commands.*

- *set lsbackup*
  Defines the backup protection slot.
- *set lsprotect enable/disable*
  Enables or disables the Low Speed Protection options on the system.
- *set lsprotect manual*
  Sets the manual mode control for protected ports.
- *set lsprotect nonrevertive*
  Defines the port non-revertive status and priority level.
- *set lsprotect remove*
  Removes port from protected mode.
- *set lsprotect revertive*
  Defines the port revertive status and priority level.
- *show lsprotect*
  Displays the low speed protection settings.
- *status lsprotect*
  Displays the current status of the low speed protection cards.

Basic Setup of a Protected System

To set up a Protected System, the following is required:

- Axxius 800 with software 1.2 or higher
- Low Speed Protection (Relay) card
- 2 - 6 Quad DS1/E1 or T1 Service Cards
  1 designated as the Backup card, others to be protected

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Use the following steps to set up a Protected System.

1. Install a Relay card in the Axxius Relay slot.
2. Set the jumpers on the Quad T1 cards to route the signal to the wire-wrap pins, see *Jumper Settings on page 14-8* for detailed instructions.
3. Prewire the chassis for Quad T1 cards (wire-wrap pins).
   Note: It is imperative that the slot designated for the Quad T1 backup card have NO wire-wrap connections.
4. Install the Backup Quad T1 card into the designated service card slot (no prewire).
5. Install Quad T1 cards that are to be protected into the prewired card slots.
   Note: These QT1 cards can be in any slot, as well as other card types. Also removal and/or replacement of any of these service cards will not effect service to cards in adjacent slots.

   Perform the following CLI commands to configure the system for protection.

Command	Description
`set lsbackup {t1_card-addr}`	This command defines the backup slot (can be any slot)
`set lsprotect enable`	To enable the Low Speed Protection option
`set lsprotect {slot:port} {revertive|nonrevertive} [priority] [1-7]`	This command defines the protected cards. Set all ports to revertive or non-revertive as necessary with an optional priority level
`show lsprotect`	To display the current settings
`status lsprotect`	To display the current status

With the above steps protection is now provided for the specified cards. Any single protected card can be pulled from its slot with only minimal interruption to service. Since protection is on a 1xN basis once protection is provided for a failed port other ports cannot be protected at the same time.

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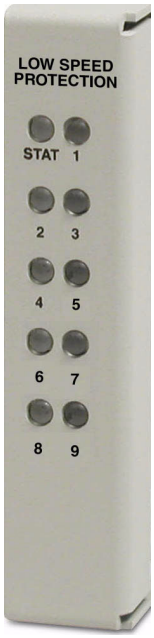
LEDs



The Low Speed Protection card has 10 LEDs, which are defined below.

LED	State	Description
STAT	Green	Enabled
	Red	Disabled
Slot Status (1-8)	Off	The corresponding slot is not being protected via the Protection card.
	Yellow	One or more ports of the corresponding slot are being protected via the Protection card.

Each channel on the Quad T1 card has two LEDs. The description of the top LED is shown below, the bottom LED is not used with this application.

Quad T1 Backup Card

State	Description
Off	Not set up as Backup
Green	Port is switched to protection mode (the port it is protecting will be flashing green)
Red	Displays red on backup card after other T1 port in same line is set up to be protected
Flashing Green	Port is set up and ready to grant backup when needed
Flashing Yellow	Port is booting up to be backup card

Quad T1 Protected Card

State	Description
Off	Not set up as Backup
Green	Protected port is healthy and not in protected mode
Red	Displays red on backup card after other T1 port in same line is set up to be protected
Flashing Green	Port has failed and the Backup card has granted protection
Flashing Yellow	Port is booting up to be backup card

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CHAPTER 18

Maintenance

In this Chapter

- Software Loading
  - Loading System Software via TFTP
  - Upgrading Software Levels via XModem
- Backup Axxius 800 Configuration
  - Save Controller Configuration
  - Load Controller Configuration
- Hot Swap Service Card

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Software Loading

Loading System Software via TFTP

1. Login to the Axxius 800, using a terminal emulation program or via Telnet.

NOTE: The tftp utility provided by Carrier Access with the downloadable software must be running, **in the same directory** as the software file.

Command	Description
`load standby tftp {ip-addr} "file-name"`	CLI command to load software to the Standby Controller. See the *load tftp* command for details.
`reset standby` `Do you really want to do this ? Y`	Reset the Standby Controller. You will be asked to confirm this command, answer Y (Yes). See *reset (controller)* command for details.
`status equipment`	Check the Standby Controller status, when it displays *hot standby* go on to the next step. **If *hot standby* does not display stop here. If you go further you may affect service.** Start the process again and if you are not successful call Customer Service. See *status equipment* command for more details.
`switch controller`	Set the signal clock switching. See the *set clock* command for details.
Note: You will be disconnected from the unit when switching Controllers. Re-establish connection with Axxius.	
`load standby tftp {ip-addr} "file-name"`	CLI command to load software to the Standby Controller. See the *load tftp* command for details.
`reset standby` `Do you really want to do this ? Y`	Reset the Standby Controller. You will be asked to confirm this command, answer Y (Yes). See *reset (controller)* command for details.

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Loading Router Software via TFTP

1. Login to the Axxius 800, using a terminal emulation program or via Telnet.
2. Enter: **load [rtr_card-addr] tftp {ip-addr} "file-name"**

   The tftp utility provided by Carrier Access with the downloadble software must also be running, **in the same directory** as the software file.
3. After download, the program will be loaded from RAM into the flash memory and the system will automatically restart. Wait until the boot menu prompt is displayed before powering down the unit. If the download fails and no prompt is seen after a full minute, cycle power and repeat the process.
4. Re-establish communication with the CLI using a terminal emulation program or Telnet. Check all configurations and system operation.

Command	Description
`load {rtr_card-addr} tftp {ip-addr} "file-name"`	CLI command to load software to the Standby Controller. See the *load tftp* command for details.
`reset standby` `Do you really want to do this ? Y`	Reset the Standby Controller. You will be asked to confirm this command, answer Y (Yes). See *reset (controller)* command for details.
`status equipment`	Check the Standby Controller status, when it displays *hot standby* go on to the next step. **If *hot standby* does not display stop here. If you go further you may affect service.** Start the process again and if you are not successful call Customer Service. See *status equipment* command for more details.
`switch controller`	Set the signal clock switching. See the *set clock* command for details.
You will be disconnected from the unit when switching Controllers. Re-establish connection with Axxius.	

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Command	Description
`load standby tftp {ip-addr} "file-name"`	CLI command to load software to the Standby Controller. See the *load tftp* command for details.
`reset standby` `Do you really want to do this ? Y`	Reset the Standby Controller. You will be asked to confirm this command, answer Y (Yes). See *reset (controller)* command for details.

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Upgrading System and Router Software via TFTP using Proxy

Required: - Router Service card (TSR) release 1.0 or higher
- Controller software 1.1 or higher
- Ethernet cable connected to port on front of Router card

1. Set up the Proxy with the following commands

```
set ethernet ip address {ip-addr} [mask]
set {rtr_lan-addr} ip address {ip-addr} [mask]
set {rtr_card-addr} proxy enable {ip-addr} [mask]
set ip gateway {ip-addr}
```

Example: (example with router in slot 3)

```
set ethernet ip address 10.0.0.1 255.0.0.0
set 3:1 ip address 192.168.100.1/24
set 3 proxy enable 192.168.100.80/24
set ip gateway 192.168.100.80
```

NOTE: See Chapter 5, CLI Commands for more information on these commands.

1. Login to the Axxius 800 using the Proxy IP address, (example: 192.168.100.80) using a terminal emulation program or via Telnet.
2. Enter: **load [slot] tftp {ip-addr} "file-name"**
   where **[slot]** = the slot number of a router card. If no slot number is listed, the file is loaded to the Controller.
   {ip-addr} = the IP address of the host device holding the downloadable software
   "file-name" = the software file name, including path, if needed. Enclosed in quotes. Example: "**c:\cac_sw\axxius1_0_z_all.mgm**".

   This example loads **axxius1_0_z_all.mgm** via tftp from the C drive and **CAC_sw** subdirectory. The path information must be provided.

   The tftp utility provided by Carrier Access with the downloadable software must also be running, **in the same directory** as the software file.

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3. After download, the program will be loaded from RAM into the flash memory and the system will automatically restart. Wait until the boot menu prompt is displayed before powering down the unit. If the download fails and no prompt is seen after a full minute, cycle power and repeat the process.
4. Re-establish communication with the CLI using a terminal emulation program or Telnet. Check all configurations and system operation.

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Upgrading Software Levels via XModem

The following upgrade can also be performed through the POTS modem.

1. Login to the Axxius 800.
2. Enter: **`load {ctrlr-id} xmodem`**
   to download the application from the binary file. This will start the system looking for an xmodem download.

   ctrlr_id Controller identifier to download the software to.
   A1, A2 All, Active or Standby. **Note: Always load code to the Standby Controller.**

   The Axxius 800 will prompt you to send the file. Use one of the following methods:

Using HyperTerminal

- Pull down the **Transfer** menu
- Select **Send File** Provide the filename (and path if required), confirm that the xmodem protocol is used for the transfer, and start the download with the **Send** button
- A window will show the progress of the download.

Using Procomm

- Pull down the **File** menu
- Select **Connection Directory**
- Under the **Data** tab, use the **Basic Options** button to confirm that the xmodem protocol is used for file transfers
- Pull down the **Data** menu, select **Send File**, provide the filename, and start the download

Another Terminal Emulation Program

When using another terminal emulation program, confirm the use of xmodem protocol at 9600 baud, provide filename (and path) and initiate the download.

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3. The binary file name is usually in the format: AxxiusAxxius.pkt. At 9600 baud, the file transfer will take approximately 20 minutes.
4. After download, the program will be loaded from RAM into the flash memory and the system will automatically restart. Wait until the boot menu prompt is displayed before powering down the unit. If the download fails and no prompt is seen after a full minute, cycle power and repeat the process.
5. Re-establish communication with the CLI using a terminal emulation program. Check all configurations and system operation.

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Backup Axxius 800 Configuration

A text file from the current configuration can be generated to reload the in the event the configuration has been lost due to card or software problems. The download of the file, generated by the **`print config`** command, can be done by direct connect to the RS-232 port or via Telnet. The upload of the file from the PC back to the Axxius 800 can only be done via direct RS-232 connection. This is because the Axxius 800 will be at factory default and an IP address is not assigned to the Axxius 800.

Save Controller Configuration

The following example is shown with a Hyperterm session, with Telnet selections in parenthesis, other programs may be used and the process is similar, however the menu selections may be different.

1. Start a HyperTerm session to an Axxius 800.
2. Type the CLI command **`print config`** and **do not** hit **[ENTER]**.
3. Type select **Transfer/Capture Text** from the drop-down menu.
   (Telnet - **Terminal/Start Logging**)
4. Name the file, select **OK**.
5. Return to the CLI command **`print config`** and hit **[ENTER]**.
   This process will exclude the **`print config`** command itself, from the configuration file you are creating.
6. (Telnet - Select **Terminal/Stop Logging**).
7. Save configuration file as a .txt file, if necessary (Telnet will create a .log file, which will need to be "saved as" a .txt file).

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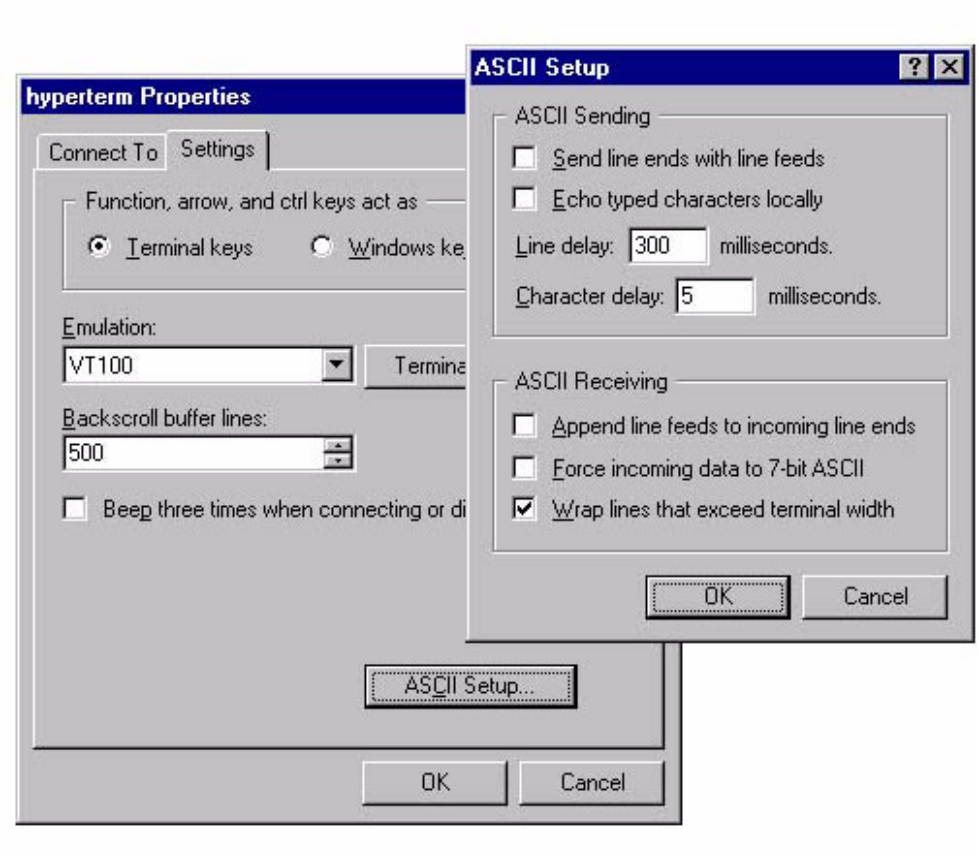
Load Controller Configuration

1. Open HyperTerm session with the Axxius 800 unit.
2. In HyperTerm, select **File/Properties/Settings/ASCII Setup**.



3. Set the **Line delay to 300 ms** and the **Character delay to 5 ms**.
4. Select **OK** to save ASCII Setup and **OK** to save Hyperterm Properties.
5. Select **Transfer/Send Text File**.
6. Select .txt file from previous steps.
7. Click **Open**.
8. Configuration will load.

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Hot Swap Service Card

To Hot-Swap (replace) a service card while the unit is powered on, follow the steps below:

1. Gently slide the Service card straight out of the slot.
2. Gently slide the new Service card into the empty slot.
3. Ensure that the new card is fastened securely into the connector at the back of the unit.

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APPENDIX A

Regulatory Approvals

In this Appendix

This appendix contains a chart of all the components of the Axxius 800 and their Regulatory Approvals.

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Axxius 800 Chassis	USA				Canada		
	UL60950	FCC Part 15, Class A	FCC Part 68	NEBS Level 3 cert, type 2 & 4 equip	CSA C22.2 No. 60950-00	ICES-003 Class A	CS-03
Axxius 800 Chassis	X	X	X		X	X	X
DS3 Controller	X	X			X	X	
DS1 Controller	X	X	X		X	X	X
Low Speed Protection	X	X	X		X	X	X
FXO	X	X			X	X	
ISDN BRI	X	X			X	X	
OCU-DP	X	X			X	X	
POTS	X	X	X		X	X	X
Quad DS1 ADPCM	X	X	X		X	X	X
Quad DS1/E1	X	X	X		X	X	X
Quad T1	X	X	X		X	X	X
V.35/54 (hardened)	X	X			X	X	
TSR (1.2)	X	X			X	X	
24 VDC PS	X	X			X	X	
48 VDC PS NI48	X	X			X	X	
48 VDC PS I48	X	X			X	X	

X	Meets this compliance
	Does not meet this compliance
	Designed to meet NEBs (not Certified)

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APPENDIX B

SNMP Interface

In this Appendix

- Overview
- SNMP Basics
- Enterprise MIB Support
- Router Enterprise MIB Support
- Public MIB Support
- Router Public MIB Support
- SNMP Trap Reports

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Overview

The Simple Network Management Protocol (SNMP) enables network operations centers (NOCs) to monitor and manage network elements across an internetwork. The Axxius 800 supports SNMP through its Ethernet port, which provides access to the carrier's TCP/IP management network.

SNMP Basics

SNMP is a mechanism for managing TCP/IP networks. It works by exchanging information between an SNMP Manager and an SNMP Agent.

Carrier Access also offers NetworkValet® EMS, Java-based SNMP management programs for Windows and Solaris computers, that provide a graphical user interface to simplify management of the Axxius 800 and other Carrier Access products.

MIB Structure

The SNMP Agent displays network information in a Management Information Base (MIB). MIBs are machine-to-machine interfaces that arrange and present information according to industry standards such as RFC 1213. MIBs are tree-like structures comprising nodes and leaves. Nodes are branch points used to divide information into categories. Leaves have object values that can be examined and changed. Common MIB objects include system names, performance statistics, and control values.

Control values are typically Integer types. This enables the object's value to represent a specific control selection. Selections are usually written in the "name(value)" format. For example, the selection "closed(1)" means that the "closed" state is indicated by a value of "1".

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Enterprise MIB Support

This release is with full SNMPv1 and SNMPv2c support. Enterprise MIBs are defined using only SMIv2 (as noted in the table).

Enterprise MIB Name	Enterprise MIB Filename
Axxius-SYSTEM-MIB	Axxius-system.mib
Axxius-DS1-MIB	Axxius-ds1.mib
Axxius-DS3-MIB	Axxius-ds3.mib
CARRIERACCESS-GENERIC- MIB	carrieraccess-generic.mib
CARRIERACCESS-TC-MIB	carrieraccess-tc.mib
CAGEN-GENERIC-MIB	cagen-generic.mib
CAGEN-SLOT-MIB	cagen-slot.mib
CAGEN-SYSTEM-MIB	cagen-system.mib
CAGEN-ALARM-MIB	cagen-alarm.mib
CAGEN-EVENT-MIB	cagen-event.mib
CAGEN-TRAPS-MIB	cagen-traps.mib
CAGEN-DS0-MIB	cagen-ds0.mib
CAGEN-DS1-MIB	cagen-ds1.mib
CAGEN-DS3-MIB	cagen-ds3.mib
CAGEN-FX-MIB	cagen-fx.mib
CAGEN-V35-MIB	cagen-v35.mib
CAGEN-TSR-MIB	cagen-tsr.mib
CAGEN-BRI-MIB	cagen-bri.mib
CAGEN-OCUDP-MIB	cagen-ocudp.mib
CAGEN-IF-FACTORY-MIB	cagen-if-factory.mib

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Router Enterprise MIB Support

Enterprise MIB Name	Enterprise MIB Filename
Router Specific	
CAGENROUTER-CARDPROFILE-MIB	caGenRouter-CardProfile.mib
CAGENROUTER-FILTERS-MIB	caGenRouter-Filters.mib
CAGENROUTER-LANPROFILE-MIB	caGenRouter-LanProfile.mib
CAGENROUTER-MANAGEMENT-MIB	caGenRouter-Mgt.mib
CAGENROUTER-REPORTS-MIB	caGenRouter-Reports.mib
CAGENROUTER-SPANTREE-MIB	caGenRouter-SpanTree.mib
CAGENROUTER-STATIC-MIB DEFINITIONS	caGenRouter-Static.mib
CAGENROUTER-DNS-MIB	caGenRouter-DNS.mib
CAGENROUTER-NTPPROFILE-MIB	caGenRouter-NTPProfile.mib
CAGENROUTER-TRUNK-MIB	caGenRouter-Trunk.mib
CAGENROUTER-WANPROFILE-MIB	caGenRouter-WanProfile.mib
CAGENROUTER-MIB	caGenRouter.mib
CAGENROUTER-TC-MIB	caGenRouter-tc.mib
CAGENTSR-MIB	caGenTsr.mib
Common with Controller	
CARRIERACCESS-GENERIC-MIB	carrieraccess-generic.mib
CARRIERACCESS-TC-MIB	carrieraccess-tc.mib
CAGEN-GENERIC-MIB	cagen-generic.mib
CAGEN-SYSTEM-MIB	cagen-system.mib
CAGEN-TSR-MIB	cagen-tsr.mib

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Public MIB Support

MIB	Table	Comments
RFC1155 (RFC-1155-smi.MIB)		
RFC1212 (RFC-1212.MIB)		
RFC1213 (RFC-1213-MIB)	system interfaces ip icmp tcp udp snmp	egp not supported
RFC1215 (RFC-1215.MIB)		
RFC1215-TRAP (RFC-1215-TRAP.MIB)		
RFC1659 (RFC1659-MIB)	rs232PortTable rs232SyncPortTable rs232InSigTable rs232OutSigTable	Supports V.35 Card Rs232AsnycPortTable not supported
RFC1907 (SNMPv2-MIB)	system sysORTable snmp	SMIv2 Extension of RFC1213
RFC2011 (IP-MIB)	ip ipAddrTable ipNetToMediaTable icmp	SMIv2 Extension of RFC1213
RFC2233 (IF-MIB)	ifTable ifXTable ifStackTable	IfTestTable, ifRcvAddressTable not supported
IANAifType-MIB	IANAifType	Used by RFC2233; no objects
RFC2493 (PerHist-TC-MIB)	Performance History TC	Defines textual conventions; no objects

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MIB	Table	Comments
RFC2494 (DS0-MIB, DS0BUNDLE-MIB)	dsx0ConfigTable dsx0ChanMappingTable dsx0BundleTable	Dsx0BondingTable not supported
RFC2495 (DS1-MIB)	dsx1ConfigTable dsx1CurrentTable dsx1IntervalTable dsx1TotalTable	Far End Tables and Fractional Table not supported
RFC2496 (DS3-MIB)	dsx3ConfigTable dsx3CurrentTable dsx3TotalTable dsx3FarEndConfigTable dsx3FarEndCurrentTable dsx3FarEndIntervalTable dsx3FarEndTotalTable	dsx3FracTable not supported
RFC2571 (SNMP-FRAMEWORK-MIB)	SNMP TC	Defines textual conventions1 no objects
RFC3291 (RFC3291-MIB)		
SNMPV2-CONF-MIB		
SNMPV2-SMI-MIB		
SNMPV2-TC-MIB		

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Router Public MIB Support

MIB	Table	Comments
RFC1213 (RFC-1213-MIB)	system interfaces ip icmp tcp udp snmp	egp not supported
RFC1907 (SNMPv2-MIB)	system snmp	SMIv2 Extension of RFC1213 SysORTable not supported
RFC2011 (IP-MIB)	ip icmp	SMIv2 Extension of RFC1213. IpAddrTable not supported. Routing table and ipNetToMediaTable supported by Enterprise mibs.
RFC2233 (IF-MIB)	ifTable	IfTestTable, ifRcvAddressTable, ifXTable, ifStackTable not supported
IANAifType-MIB	IANAifType	Used by RFC2233; no objects

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SNMP Trap Reports

The Axxius 800 can send the following SNMP trap reports.

Standard Traps

Trap	Description	Test Method
authentication Failure	Occurs when a bad community string is used.	Attempt a Get or Set using an invalid community string.
linkDown	Sent when a DS1 changes from an up (in-service) state to a down (out-of-service) state. It is not sent when a DS1 is set “down” by a manual command. Also sent when a DS1 is set up manually, if it is in an out-of-service state.	Disconnect an in-service DS1.
linkUp	Sent when a DS1 changes from a down (out-of-service) state to an up (in-service) state. It is not sent when a DS1 is set “up” by a manual command.	Connect a DS1 and put it into service.
coldStart	Sent whenever the SNMP agent is restarted as a result of a software reset or unit powerup.	Cycle the power off and on.

Enterprise Traps

Trap	Description	Test Method
caGenEventLogTrap	This trap is generated when an event has been logged into the device's Event Log. This trap contains 5 mandatory variable bindings and may contain up to 3 optional variable bindings. The mandatory variable bindings are caGenEventLogIndex, caGenEventSeverity, caGenEventCategory, caGenEventCode, and caGenEventDate. The optional variable bindings are caGenEventInfoParam1, caGenEventInfoParam2 and caGenEventAdditionalText. The optional variable bindings (if present) will always appear at the end of the variable binding list.	

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APPENDIX C

Loopback Tests

In this Appendix

- Overview
- DS1 Loopbacks
- V.35 Loopbacks
- V.35/V.54 Loop

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Alarms

Test Alarm

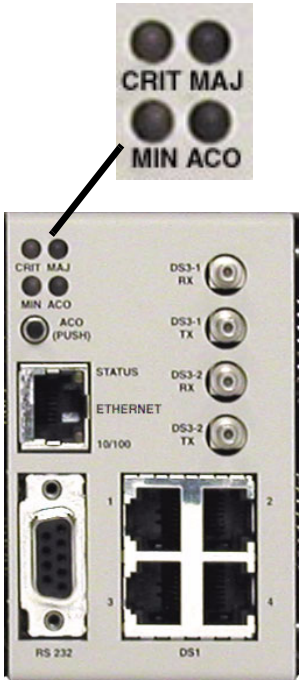
The Axxius 800 alarm functions can be manually tested using the following command for setting critical, major and minor alarms. Turning alarms on or off will produce alarm messages and log entries stating the alarm event was manually set/cleared by the user.

Syntax: **`set alarms {critical|major|minor} {off|on}`**

Identify Alarm

Alarm indicators

- LEDs - When an Alarm is triggered, the LED will display a red/yellow indicator light, which will stay on until the Alarm is cleared. The following is the LED information for the Control Panel Interface card. For LED information for a specific service card see the chapter for that card.



LED	State	Description
CRITICAL	Off	No critical alarms present
	Red	Critical alarms present
MAJOR	Off	No major alarms present
	Red	Major alarm present
MINOR	Off	No minor alarms present
	Red	Minor alarms present
ACO	Off	Normal mode. No alarms are being suppressed.
	Red	Alarm cutoff active. One or more active alarms suppressed.

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The following are hyperlinks to all the card LED information:

DS1 Controller Card, LEDs

DS3 Controller Card, LEDs

FXO Voice Card, LEDs

ISDN BRI Card, LEDs

OCU-DP Card, LEDs

Single Channel POTS Cards, LEDs

Quad DS1 ADPCM Card, LEDs

Quad T1 & Quad DS1/E1 Card, LEDs

Terminal Server Router Card, LEDs

V.35/.54 Card, Connector Pinouts

Low Speed Protection Card, LEDs

Power Supply, LEDs

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Display Alarms

Use the **alarms** command to display the active alarms. Each alarm is related to a particular address and has a severity category (major, minor, critical, alert). The report can be filtered by port address and/or severity.

Syntax: **alarms [slot|slot:port|slot:port:channel] [category] [severity]**

```
> alarms
 Time      Date     Severity Description
  07:35:45 01/04/2002 Major    Test Major Alarm
  07:35:21 01/04/2002 Minor    Test Minor Alarm
  07:34:57 01/04/2002 Critical Test Critical Alarm
  00:00:20 01/01/2002 Major    6:1-TSR Ethernet Link Down
  00:00:05 01/01/2002 Major    A:2-DS1 Loss Of Signal
  00:00:05 01/01/2002 Major    A:1-DS1 Loss Of Signal
Total=6
```

```
Category = bri|ds1|env|equipment|fxo|fxs|rtr|v35
Severity = alert|critical|info|major|minor
```

Clear Alarm

Once an alarm is identified then the process of clearing it can begin.

- Silence Alarm, if necessary (Alarm Cut Off CLI command: **aco**)
- Check Connection
- Check Cable, replace if necessary
- Check hardware and replace if necessary
- Call Customer Service

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Logs

Display the event log to view a log of all system events, or narrow the view to only display specific information.

Syntax: **`log [slot|slot:port] [category] [severity]`**

Example: **`log`**

```
  Time      Date     Severity Description
  ----      ----     -------- -------------------------------
00:00:11 01/01/2002 Info     8-FXSPSMx1 Card Detected
00:00:10 01/01/2002 Major    A:2:1-DS1 Loss Of Frame
00:00:10 01/01/2002 Major    A:1:1-DS1 Loss Of Frame
00:00:09 01/01/2002 Major    A:2:28-DS1 Loss Of Frame
00:00:09 01/01/2002 Major    A:2:27-DS1 Loss Of Frame
00:00:09 01/01/2002 Major    A:2:26-DS1 Loss Of Frame
00:00:08 01/01/2002 Major    A:2:20-DS1 Loss Of Frame
00:00:08 01/01/2002 Major    A:2:19-DS1 Loss Of Frame
00:00:08 01/01/2002 Major    A:2:18-DS1 Loss Of Frame
00:00:04 01/01/2002 Info     6-V35x2H Card Detected
00:00:02 01/01/2002 Info     Transmit Clock Source:Internal
00:00:02 01/01/2002 Info     A-T3x2 Card Detected
00:00:01 01/01/2002 Info     A1-Became The Active Controller
00:00:01 01/01/2002 Info     System Powerup
Total=14


          Category = bri|ds1|env|equipment|fxo|fxs|rtr|v35
Severity = alert|critical|info|major|minor
```


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Status and Performance

The following status commands will display vital information regarding the system that will aid in troubleshooting. All commands listed below are hyperlinked to the CLI command.

status (adpcm)

status (bri)

status clock

status (ds0)

status (ds1)

status (ds3)

status equipment

status (fxo)

status (fxsPS or fxsPSM)

status ipds0

status (ocudp)

status (router)

status (router-lan)

status (router-trunk)

status (v54)

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Overview

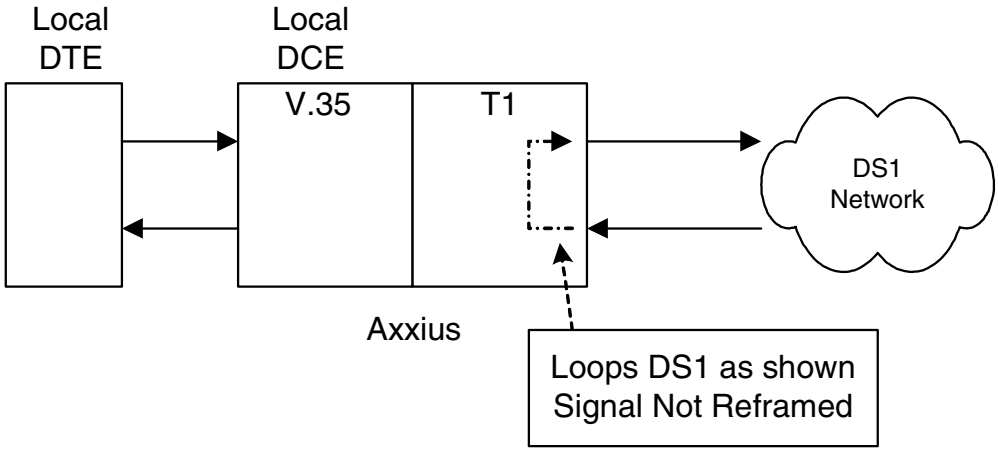
A loopback test is a diagnostic procedure in which a signal is transmitted and returned to the sending device after passing through all or a portion of a network or circuit. The returned signal is compared with the transmitted signal in order to evaluate the integrity of the equipment or transmission path.

DS1 Loopbacks

Note: T1 LEDs flash green during any DS1 loopback.

DS1 Line Loop

Loops at DS1 (at framer), signal not reframed. Have DS1 vendor check for framing/ errors.



Enable Line Loopback

```
> set a:1 line loopup
OK
```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View Status of Loopback

```
> status a:1
SLOT A:
Status for DS1  1:
    Receive:                Traffic
    Transmit:               Traffic
    Loopback:               LINE
```

Disable Line Loopback

```
> set a:1 line loopdown
OK
```

View Status of Loopback

```
> status a:1
SLOT A:
Status for DS1  1:
    Receive:                Traffic
    Transmit:               Traffic
    Loopback:               OFF
```


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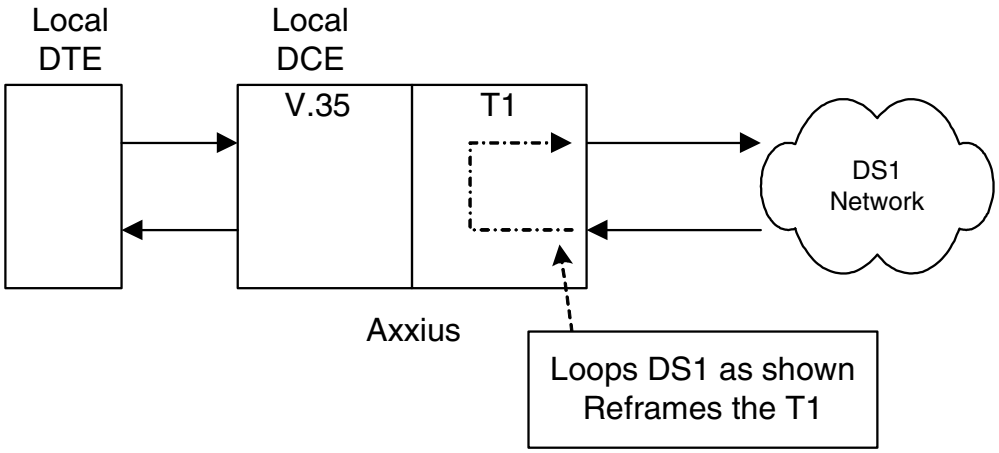
DS1 Payload Loop

Loops at DS1 (in framer) and reframes the T1. Have DS1 vendor check for framing/ errors.



Enable Payload Loopback

```
> set a:1 payload loopup
OK
```

View Status of Loopback

```
> status a:1
SLOT A:
Status for DS1  1:
    Receive:                Traffic
    Transmit:               Traffic
    Loopback:               PAYLOAD
```

Disable Payload Loopback

```
> set a:1 payload loopdown
OK
```

View Status of Loopback

```
> status a:1
SLOT A:
Status for DS1  1:
    Receive:                Traffic
    Transmit:               Traffic
    Loopback:               OFF
```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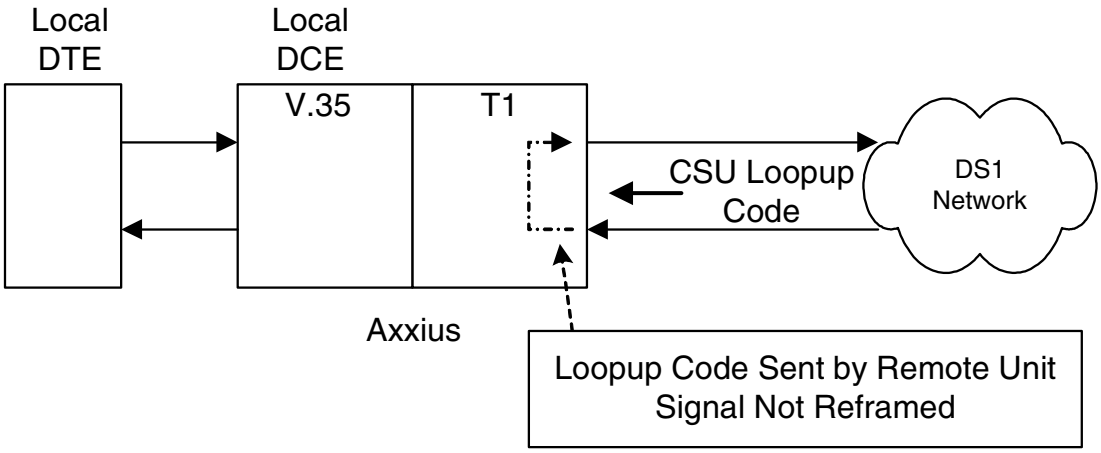
Receiving DS-1 CSU Loop

Causes a line Loopback. Loopup code sent by remote unit or network. Occurs at local DS1 CSU. Have DS1 vendor check for framing/errors.



Enable Detection of CSU Loopcode

Enable detection of CSU loop code (10000 for loopup; 100 for loopdown).

```
> set a:1 loopdetect on
OK
```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View Status of Loopback

```
> show a:1
SLOT A:
Settings for DS1  1:
    Circuit ID:              CAC DS1# A:1
    Up/Down:                 UP
    Framing:                 ESF
    Line Coding:             B8ZS
    Line Build Out:          DSX-1 EQUALIZATION FOR 0-133 ft.
(CSU 0dB)
    Loop Code Detection:     ON (Default)
    Loopback:                OFF
    FDL Type:                None

    Performance Threshold Settings          15 min.     1 day
    unavailable seconds:                      0           0
    severely errored seconds:                 0           0
    errored seconds:                          0           0
    sev. errored frame seconds:               0           0
    line errored seconds:                     0           0
    controlled slip seconds:                  0           0
    bursty errored seconds:                   0           0
    degraded minutes:                         0           0
    total linecode violations:                0           0
    total pathcode violations:                0           0


> status a:1
SLOT A:
Status for DS1  1:
    Receive:                 Traffic
    Transmit:                Traffic
    Loopback:                LINE
```


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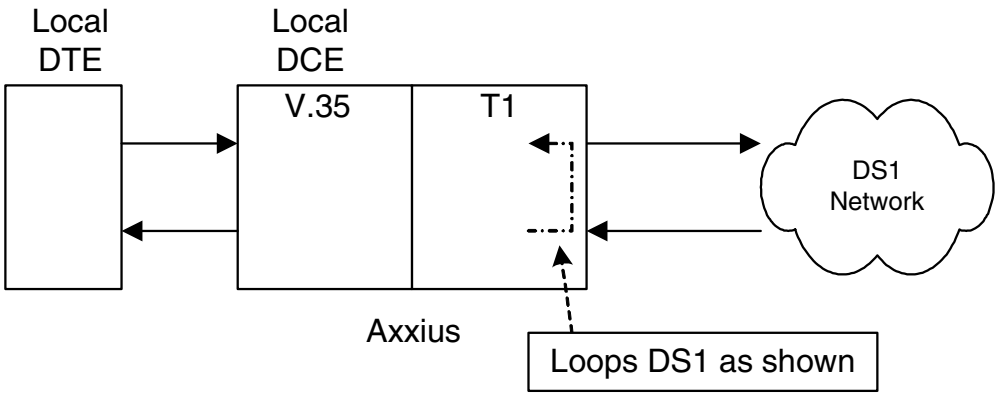
DS1 Equipment Loop

Note: Quad T1 LED flashes green during equipment loop.



Enable Equipment Loopback

Where a Quad T1 card is in slot 5.

```
> set 5:1 equipment loopup
OK
```

View Status of Loopback

```
> show 5:1
SLOT 5:
Settings for DS1  1:
    Circuit ID:              CAC DS1# 5:1
    Up/Down:                 UP
    Framing:                 ESF
    Line Coding:             B8ZS
    Line Build Out:          DSX-1 EQUALIZATION FOR 0-133 ft.
(CSU 0dB)
    Loop Code Detection:     ON
    Loopback:                EQUIPMENT
    FDL Type:                None

    Performance Threshold Settings          15 min.      1 day
    unavailable seconds:                      0            0
    severely errored seconds:                 0            0
```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```
    errored seconds:                          0          0
    sev. errored frame seconds:               0          0
    line errored seconds:                     0          0
    controlled slip seconds:                  0          0
    bursty errored seconds:                   0          0
    degraded minutes:                         0          0
    total linecode violations:                0          0
    total pathcode violations:                0          0
```

Disable Equipment Loopback

```
> set 5:1 equipment loopdown
OK
```

View Status of Loopback

```
> show 5:1
SLOT 5:
Settings for DS1  1:
    Circuit ID:              CAC DS1# 5:1
    Up/Down:                 UP
    Framing:                 ESF
    Line Coding:             B8ZS
    Line Build Out:          DSX-1 EQUALIZATION FOR 0-133 ft.
(CSU 0dB)
    Loop Code Detection:     ON
    Loopback:                OFF
    FDL Type:                None

    Performance Threshold Settings          15 min.      1 day
    unavailable seconds:                      0          0
    severely errored seconds:                 0          0
    errored seconds:                          0          0
    sev. errored frame seconds:               0          0
    line errored seconds:                     0          0
    controlled slip seconds:                  0          0
    bursty errored seconds:                   0          0
    degraded minutes:                         0          0
    total linecode violations:                0          0
    total pathcode violations:                0          0
```


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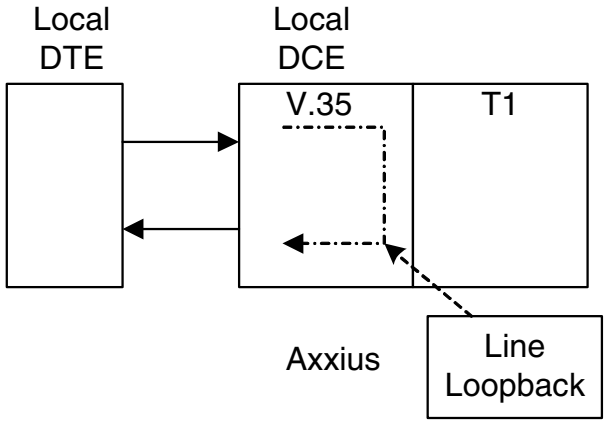
V.35 Loopbacks

V.35 Line Loop

Note: V.35 LED flashes green during line loop.

Loop occurs at V.35 port. Check for sync and errors at local data port.



Enable Line Loopback

Where a V.35 card is in slot 6.

```
> set 6:1 line loopup
OK
```

View Status of Loopback

```
> show 6:1
SLOT 6:
Settings for V35 Port 1:
     CTS:                    Always High
     Timing:                 Source
     Rx Clock Inversion:     Normal
     Tx Clock Inversion:     Normal
     Data Inversion:         Normal
     Data Speed:             64K
     Data Rate:              1536 K
     Loopback:               Line
```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Disable Line Loopback

```
> set 6:1 line loopdown
OK
```

View Status of Loopback

```
> show 6:1
SLOT 6:
Settings for V35 Port 1:
     CTS:                    Always High
     Timing:                 Source
     Rx Clock Inversion:     Normal
     Tx Clock Inversion:     Normal
     Data Inversion:         Normal
     Data Speed:             64K
     Data Rate:              1536 K
     Loopback:               None
```


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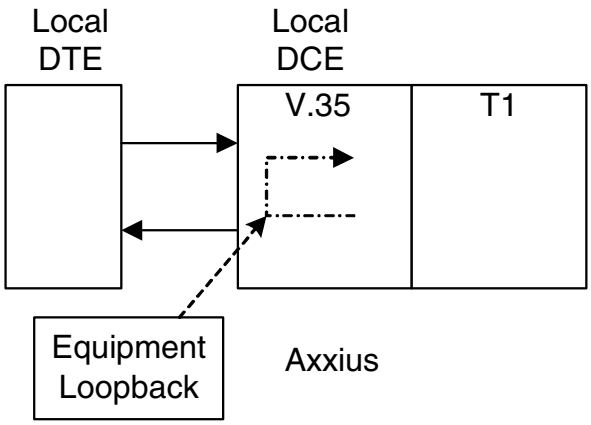
V.35 Equipment Loop

Note: V.35 LED flashes yellow during equipment loop.

Loops at local V.35 port. Check for sync and errors at remote data port, with or without BERT.



Enable Equipment Loopback

Where a V.35 card is in slot 6.

```
> set 6:1 equipment loopup
OK
```

View Status of Loopback

```
> show 6:1
SLOT 6:
Settings for V35 Port 1:
     CTS:                    Always High
     Timing:                 Source
     Rx Clock Inversion:     Normal
     Tx Clock Inversion:     Normal
     Data Inversion:         Normal
     Data Speed:             64K
     Data Rate:              1536 K
     Loopback:               Equipment
```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Disable Equipment Loopback

```
> set 6:1 equipment loopdown
OK
```

View Status of Loopback

```
> show 6:1
SLOT 6:
Settings for V35 Port 1:
     CTS:                    Always High
     Timing:                 Source
     Rx Clock Inversion:     Normal
     Tx Clock Inversion:     Normal
     Data Inversion:         Normal
     Data Speed:             64K
     Data Rate:              1536 K
     Loopback:               None
```


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V.35/V.54 Loop

V.35/V.54 Service Card Description

The V.35 Card with V.54 Loop Test provides the capability for the V.35 card to detect network loop back initiation signals and provide a network loop back for loop testing. Each channel of the V.35 will continuously monitor the incoming data bit stream for a particular loop pattern. On detection of the pattern the channel will acknowledge the loop test request and put the channel into loop back. The channel will then continuously monitor for the loop test end pattern. On detection of the loop end pattern the channel will remove loop back and resume normal operation. Front panel LED's will indicate Loop test. Each channel can also initiate the loop test pattern causing another V.54 compatible device to loop back. The channel will then transmit a test pattern and calculate bit error rate (BER).

View V.35/V.54 Card Configuration

Where a V.35/V.54 card is in slot 6.

```
> show 6:1
SLOT 6:
Settings for V35 Port 1:
     CTS:                    Always High
     Timing:                 Source
     Rx Clock Inversion:     Normal
     Tx Clock Inversion:     Normal
     Data Inversion:         Normal
     Data Speed:             64K
     Data Rate:              768 K
     V.54 Rx LB:             disabled
     V.54 Rx Addr:           255
     V.54 Test Addr:         255
     V.54 Tx Prep count:     15
     V.54 Rx Prep count:     15
     V.54 Test Pattern:      QRSS
     V.54 Ignore ACK:        OFF
     Loopback:               None
```


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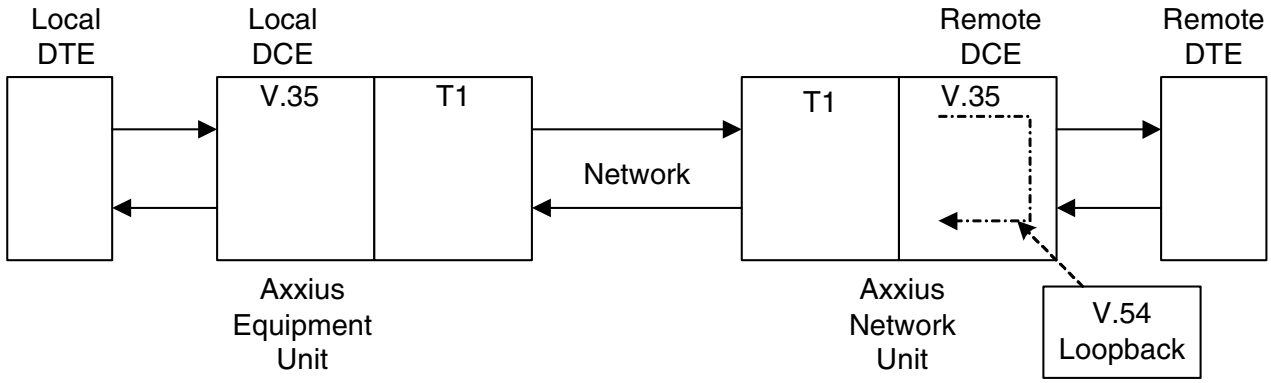
V.54 Loop

Note: Local LED flashes yellow, remote LED flashes green.



Enable V.54 Loop

Where a V.35/V.54 card is in slot 6.

```
> set 6:1 v54 network enable
OK
```

View Status of Loopback

```
> show 6:1
SLOT 6:
Settings for V35 Port 1:
     CTS:                    Always High
     Timing:                 Source
     Rx Clock Inversion:     Normal
     Tx Clock Inversion:     Normal
     Data Inversion:         Normal
     Data Speed:             64K
     Data Rate:              768 K
     V.54 Rx LB:             enabled
     V.54 Rx Addr:           255
     V.54 Test Addr:         255
     V.54 Tx Prep count:     15
     V.54 Rx Prep count:     15
     V.54 Test Pattern:      QRSS
     V.54 Ignore ACK:        OFF
     Loopback:               None
```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V.54 Equipment Loopback

Enable V.54 Equipment Loopup

Where a V.35/V.54 card is in slot 6.

```
> set 6:1 v54 equipment loopup
OK
```

View Status of Loopback

```
> show 6:1
SLOT 6:
Settings for V35 Port 1:
     CTS:                    Always High
     Timing:                 Source
     Rx Clock Inversion:     Normal
     Tx Clock Inversion:     Normal
     Data Inversion:         Normal
     Data Speed:             64K
     Data Rate:              768 K
     V.54 Rx LB:             enabled
     V.54 Rx Addr:           255
     V.54 Test Addr:         255
     V.54 Tx Prep count:     15
     V.54 Rx Prep count:     15
     V.54 Test Pattern:      QRSS
     V.54 Ignore ACK:        OFF
     Loopback:               Equipment(V.54)

> status 6:1
SLOT 6:
Status for V35  PORT 1:
      DCD:   High
      CTS:   High
      DSR:   High
      RTS:   High
      DTR:   High
     BERT:   RUNNING (Syncing up)
```


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```
> status 6:1
SLOT 6:
Status for V35  PORT 1:
      DCD:   High
      CTS:   High
      DSR:   High
      RTS:   High
      DTR:   High
     BERT:   RUNNING
     BITS:      8386950
     ERRS:            0
      BER:   0.00000000
```

Disable V.54 Equipment Loopup

```
> set 6:1 v54 equipment loopdown
OK
```

View Status of Loopback

```
> status 6:1
SLOT 6:
Status for V35  PORT 1:
      DCD:   High
      CTS:   High
      DSR:   High
      RTS:   High
      DTR:   High
     BERT:   Complete
     BITS:    109030350
     ERRS:            0
      BER:   0.00000000
BERT DATE:   1/5/2001 01:39:18
```


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GLOSSARY

10Base-T The most widely installed Ethernet local area networks (LANs) use ordinary telephone twisted-pair wire. When used on Ethernet, this carrier medium is known at 10BASE-T. 10BASE-T supports Ethernet's 10 Mbps transmission speed.

100Base-TX 100Base-TX is a 100 Mbps local area network, know as Fast Ethernet.

ADPCM Adaptive Differential Pulse Code Modulation. A speech coding method which uses fewer bits than the traditional PCM (Pulse Code Modulation). ADPCM allows encoding of voice signals in half the space PCM allows.

Annex D A frame relay standard extension dealing with the communication and signaling between customer premises and equipment and frame relay network equipment for the purpose of querying network status information.

Analog The telephone transmission of voice, video or image. Telephone transmission and/or switching that is not digital.

authentication The process of identifying an individual, usually based on a username and password combination, although the process can be many more steps. In security systems, authentication is distinct from authorization, which is the process of giving individuals access to system objects based on their identity. Authentication merely ensures that the individual is who he or she claims to be, but says nothing about the access rights of the individual. Authentication in whatever form, is usually followed by authorization.

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authorization The process of granting or denying access to a network resource. Most computer security systems are based on a two-step process, sometimes more. The first stage is authentication, which ensures that a user is who he or she claims to be and in some cases, that the user is not already on the system. The second stage is authorization, which allows the user access in varied degrees to various resources based on the preassigned privileges associated with the user's identity.

B-channel Short for Bearer-channel, the main data channel in an ISDN connection. Basic Rate ISDN (BRI) service consists of two 64 Kbps B-channels, and one D-channel for transmitting control information.

B8ZS Bipolar 8-Zero Substitution, a coding scheme that maintains ones density.

backplane A common bus at the rear of the computer chassis connecting each circuit card slot to the other parts of the system. Motherboards on modern PCs are a general equivalent. It also distributes low-voltage AC and DC, filtered and un-filtered power to each slot.

bandwidth The amount of data that can travel through a channel in a given period of time. Bandwidth is usually measured in cycles per second (hertz) or in bits per second (BPS). The larger the bandwidth, the more information the network can handle. ISDN is usually 64KB, 128KB or 256KB. ASDL and DSL are generally faster than ISDN and sometimes faster than cable. Cable connections are usually 500KB or 1MB. T1 is 1.5MB and T3 is 45MB.

Basic Rate Interface (BRI) Basic Rate Interface is an Integrated Services Digital Network (ISDN) interface typically used by smaller sites and customers. This interface consists of a single 16 Kbps Data (or "D") channel plus 2 Bearer (or "B") channels for voice and/or data.

BER Bit Error Rate, the number of erred bits divided by the total number of bits.

BERT Bit Error Rate Tester

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bipolar The predominant signaling method used for digital transmission services, such as DDS and T1. The signal carrying the binary value alternates between positive and negative. Zero and one values are represented by the signal amplitude at either polarity, while no-value "spaces" are at zero amplitude.

Bipolar Violation (BPV) The presence of two consecutive "one" bits of the same polarity on the T carrier line.

bit Contraction of the words "binary" and "digit".

Bit Error Rate Test (BERT) A test that reflects the ratio of errored bits to the total number transmitted. Usually shown in exponential form (10^-6) to indicate that one out of a certain number of bits are in error.

bit robbing Telephony coined phrase to describe a transmission process. The technique in T1 multiplexing in which the least significant bit (bit 8) of each byte in selected frames is "robbed" from being used to carry message information, and instead is used to carry signaling information.

bps Bits per second

BPV Bipolar Violation.

BRI Basic Rate Interface (2b+d) in ISDN.

bridge A bridge is any hardware device that connects two physically distinct network segments, usually at a lower network layer than would a router, however the two terms are often interchanged. A device that connects two local-area networks (LANs), or two segments of the same LAN. The two LANs being connected can be alike or dissimilar. Unlike routers, bridges are protocol independent. They simply forward packets without analyzing and re-routing messages. Consequently, they're faster than routers, but also less versatile.

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broadband

A technology that provides an extremely wide and fast bandwidth so that many people can simultaneously use the service. It is generally associated with multiple types of transmissions on the same connection such as voice, data, video and digital or analog information.

C-bit Coding Violation (CCV)

For C-bit Parity and SYNTRAN DS3 applications, this is the count of coding violations reported via the C-bits. For C-bit Parity, it is a count of CP-bit parity errors occurring in the accumulation interval. For SYNTRAN, it is a count of CRC-9 errors occurring in the accumulation interval.

C-bit Errored Seconds (CES)

An CES is a second with one or more CCVs OR one or more Out of Frame defects OR a detected incoming AIS. This count is only for the SYNTRAN and C-bit Parity DS3 applications. This gauge is not incremented when UASs are counted.

C-bit Severely Errored Seconds (CSES)

A CSES is a second with 44 or more CCVs OR one or more Out of Frame defects OR a detected incoming AIS. This count is only for the SYNTRAN and C-bit Parity DS3 applications. This gauge is not incremented when UAS are counted.

CDPD

Cellular Digital Packet Data. A radio technology that supports the transmission of packet data to speeds of up to 19.2 Kbps over the existing analog AMPS (Advanced Mobile Phone Service) cellular network, with appropriate CDPD upgrades.

Central Office (CO)

Where telephone companies terminate customer lines and locate switching equipment to interconnect those lines with other networks.

Challenge Handshake Authorization Protocol (CHAP)

A strong authentication method used with PPP for user login. A type of authentication in which the authentication agent (typically a network server) sends the client program a key to be used to encrypt the username and password. This enables the username and password to be transmitted in an encrypted form to protect them against eavesdroppers. When using CHAP, the username/password is sent encrypted over the connection, preventing sniffing. See also PAP.

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channel — A generic term for a communications path on a given medium; multiplexing techniques allow providers to put multiple channels over a single medium.

Channel Associated Signaling (CAS) — A form of circuit state signaling in which the circuit state is indicated by one or more bits of signaling status sent repetitively and associated with that specific circuit.

CIDR — Classless Inter-Domain Routing. CIDR is a new addressing scheme for the Internet which allows for more efficient allocation of IP addresses than the old Class A, B, and C address scheme.

Circuit Identifier — This is a character string specified by the circuit vendor, and is useful when communicating with the vendor during the troubleshooting process.

Clear Channel — A digital circuit where no framing or control bits (i.e. for signaling) are required, thus making the full bandwidth available for communications. For example, a 56 Kbps circuit is typically a 64 Kbps digital circuit with 8 Kbps used for signaling. Sometimes called Switched-56.

CLI — Command Line Interface

Classless Routing — See CIDR

cold-standby — In a redundant DS3 controller setup, the standby controller can be in two states, the hot-standby signifies that the card is ready to go active (healthy) but for some reason (code of the 2 controllers is not the same) it will need to reconfigure the box when it goes active, which will be service affecting. Also see hot-standby.

Command Line — The command line is where you enter MS-DOS commands.

Community Name — String that defines an administrative relationship between SNMP entities.

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Constant Bit Rate (CBR)

Refers to the transmission properties that data, video and voice uphold when traversing a transport medium. Information traveling at a constant bit rate means there is no fluctuation in signal integrity.

CSU

Channel Service Unit, the interface to the T1 line that terminates the local loop.

Customer Premise Equipment (CPE)

On digital circuits provided by the telephone company, any terminating hardware owned by the user and not by the Telco (telephone company) is generically referred to as CPE.

Cyclic Redundancy Check (CRC)

A check sum indicator based on the remainder of a polynomial calculation performed on the transmitted data that is used to verify, with some fixed probability of correctness, whether that data was transmitted.

D4 Superframe (SF)

D4 Superframe (SF) Framing Format. The most popular framing format in the T1 environment. Its name stems from the way framing is performed in the D-series of channel banks from AT&T. There are 12 separate 193-bit frames in a superframe. The D4 framing bit is used to identify both the channel and the signaling frame. In D4 framing, signaling for voice channels is carried in-band by every channel along with the encoded voice. “Robbed bit signaling” is a technique used in D4 channel banks to convey signaling information. With this technique, the eighth bit (least significant bit) of each of the 24 8-bit timeslots is “robbed” every sixth frame to convey voice related signaling information (on-hook, off-hook, etc.) for each voice channel.

Data Terminal Equipment (DTE)

Data Terminal Equipment refers to communications hardware such as computers, terminals, and similar equipment, as opposed to DCE such as modems.

DDS

Digital Data System. DDS is a private line digital service, typically with data rates at 2400, 4800, 9600 and 56000 bits per second.

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DHCP

Dynamic Host Configuration Protocol. DHCP is a network configuration that allows maintenance to be performed from a central site rather than by end users.

download

To transfer data from a larger "host" system to a smaller "client" system's hard drive or other local storage device.

Drop & Insert (D&I)

As applied to T1, D&I refers to the process whereby one DS0 channel is demultiplexed out of the DS1 synchronous bit stream at one port of a digital channel back and another DS0 inserted back in.

DS0

Digital Signal Zero, the standard bandwidth for digitized voice channels.

DS1

Digital Signal Level 1. A digital signal transmitted at a nominal rate of 1.544 Mbps.

DS3

Digital Signal Level 3. A digital signal transmitted at a nominal rate of 44.736 Mbps.

DSU/CSU

Data Service Unit/Channel Service Unit. A device terminating a digital channel on a customer's premises where it performs line coding, line conditioning and equalization functions while responding to the receipt of loopback codes sent from the Central Office (CO) A DSU/CSU sits between the digital line coming in from the CO and devices such as channel banks or data communications devices.

Dual Tone Multi-Frequency (DTMF)

Dual Tone Multi-Frequency is the system used by touch-tone telephones. DTMF assigns a specific sound frequency, or tone, to each key so that it can easily be identified by a monitoring microprocessor. That frequency is then translated into a usable analog or digital signal. This is commonly known as Touch Tone.

Dynamic Host Configuration Protocol (DHCP)

A network configuration that allows maintenance to be performed from a central site rather than by end users.

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E&M Signaling

A signaling arrangement that uses separate leads, called respectively the E lead and the M lead, for the signaling and voice signals. The M lead (derived from 'Mouth') transmits ground or battery to the distant end of the circuit, while incoming signals are received as either a grounded or open condition on the E (derived from 'Ear') lead. The E&M tie trunk interface functions as a *de facto* standard in the PBX - T1 multiplexer Telco environment.

Earth ground

A wire conductor that terminates in the earth for electrical purposes. It is generally the negative side of the circuit and is most important in alternating current (AC) circuits. Chassis Ground is the general term used in direct current (DC) circuits.

Electro-magnetic Interference (EMI)

Equipment used in high speed data systems, including ATM, that generate and transmit many signals in the radio frequency portion of the electromagnetic spectrum. Interference to other equipment or radio services may result if sufficient power from these signals escape the equipment enclosures or transmission media. National and international regulatory agencies (FCC, CISPR, etc.) set limits for these emissions. Class A is for industrial use and Class B is for residential use.

Ethernet

Ethernet is a particular network topology and protocol, especially useful in LANs. It comes in various speeds and is often regarded as THE current technology for general network direct connection. The current connectivity is generally considered to be 10Base-T or 100Base-T, while the backbone, if one is used, is coaxial cable or Fiber optics. There is also a 1000Base-T for certain specialty copper joining situations.

Facilities Data Link (FDL)

FDL supports the communication of various network information in the form of in-service monitoring and diagnostics.

File Transfer Protocol (FTP)

An Internet protocol that enables you to transfer files between computers on the Internet.

filter

An operating parameter used with routers that can be set to block the transfer of packets from one LAN to another.

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frame — A fragment of data that is packaged into a frame format, which comprises a header, payload, and trailer.

frame relay — A packet-switching protocol for connecting devices on a Wide Area Network (WAN). Frame Relay networks in the U.S. support data transfer rates at T1 (1.544 Mbps) and T3 (45 Mbps) speeds. Most telephone companies now provide Frame Relay service for customers who want connections at 56 Kbps to T1 speeds. However, it is being replaced in some areas by faster technologies, such as ATM.

FX — Foreign Exchange. A Central Office trunk which has access to a distant central office. Dial Tone is returned from that distant Central Office, and a location can be reached in the area of the foreign Central Office by dialing a local number. This will provide easier access for customers in that area and calls may be made anywhere in the foreign exchange area for a flat rate.

FXO — Foreign Exchange Office. Foreign exchange (FX) service is a service that can be ordered from the telephone company that provides local telephone service from a central office which is outside (foreign to) the subscriber's exchange area. Simply, a user can pick up the phone in one city and receive a dial tone in the foreign city. This kind of connection is provided by a type of trunk called foreign exchange (FX) trunk. FX trunk signaling can be provided over analog or T1 links. Connecting POTS telephones to a computer telephony system via T1 links requires a channel bank configured with FX type connections.

FXS — Foreign Exchange Station.

gateway — A link from one computer system to a different computer system.

ground — A physical connection to the earth or other reference point.

ground start (GS) — A method of signaling from a terminal or subscriber loop to a switch, in which method one side of a cable pair is temporarily grounded

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GUI

Graphical User Interface, pronounced "GOOEY". A set of screen presentations and metaphors that utilize graphic elements such as icons in an attempt to make an operating system easier to use.

High Density Bipolar 3 (HDB3)

A bipolar coding method that does not allow more than 3 consecutive zeros.

High level Data Link Control (HDLC)

The HDLC protocol secures information in a data frame that allows devices to control data flow and correct errors. For any HDLC communications session, one station is designated primary and the other secondary.

hop

Each individual short trip that packets make from router to router, as they are routed to their destination is a Hop.

host

A computer that allows users to communicate with other host computers on a network.

hot-standby

In a redundant DS3 controller setup, the standby controller can be in two states, the hot-standby signifies that the card is ready to take over for the active and the switch will not affect service. Also see cold-standby.

hub

A common connection point for devices in a network. Hubs are commonly used to connect segments of a LAN. A hub contains multiple ports.

IP

Internet Protocol

Integrated Services Digital Network (ISDN)

A technology offered by telephone carriers that allows for the rapid transfer of voice and data. ISDN supports data transfer rates of 64 Kbps (64,000 bits per second). Most ISDN lines offered by telephone companies give you two lines at once, called B channels. You can use one line for voice and the other for data, or you can use both lines for data to give you data rates of 128 Kbps, slightly more than 2 times the data rate provided by today's fastest modems.

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ISDN BRI

Integrated Services Digital Network. BRI, which is 144,000 bits per second and designed for the desktop.

internet

"A network of networks," the Internet supports FTP, WWW, Gopher, E-Mail, Telnet, and many other world-wide information transfer protocols and services. ISPs provide an effective interface with the Internet. The Internet itself is made up of thousands of LANs and WANs, all using TCP/IP to provide information services to millions of users. A worldwide network of networks that all use the TCP/IP communications protocol and share a common address space.

Internet Protocol (IP)

Internet Protocol, the method by which most Internet activity takes place. Members with access to TCP/IP through a SLIP or PPP connection can connect to many ISP services in this manner. As the name implies, it is a protocol for network activity. Most current networks support some sort of TCP or IP directly or indirectly.

IP address

A string of four numbers separated by periods (such as 111.22.3.144) used to represent a computer on the Internet. The format of the address is specified by the Internet Protocol in RFC 791. Each of the four number must be 255 or less; they may be 0.

jitter

Interference on an analog line caused by a variation of a signal from its reference timing slots. Jitter can cause problems in the receipt of data and any subsequent processing of that data.

kbps

A transmission speed. Kilobits (thousands of bits) per second.

kilobyte (kb)

A representative word meaning one thousand bytes.

LAN (Local Area Network)

A group of computers at a single location (usually an office or home) that are connected by phone lines, network cables of various configurations or coaxial cable. Usually controlled and administered by a system or network administrator.

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Line Coding Violation (LCV)	This parameter is a count of both BPVs and EXZs occurring over the accumulation period. An EXZ increments the LCV by one regardless of the length of the zero string.
Line Errored Seconds (LES)	A Line Errored Second is a second in which one or more CVs occurred OR one or more LOS defects.
Line Interface Unit (LIU)	Typically, a controller device in a D-type channel bank, that incorporates a controller, channel service unit (CSU), ringing generator and power converter on a single card to interface between the T1 network and the analog functions of the channel bank.
LLC	Logical Link Control. A protocol developed by the IEEE 802.2 committee for data-link-level transmission control
LMI	Local Management Interface. A specification for the use of frame-relay products that define a method of exchanging status information between devices such as routers.
LMU	Line Monitor Unit.
LOF	Loss of Frame.
LOS	Los of Signal.
loop back test	Any test in which a test signal is injected at one end of a circuit, is looped back at the other end, and monitored at the originating end.
loop start (LS)	A method of demanding dial tone from the central office by completing an electrical pathway between the outbound and return conductors of a telephone line. Loop start is employed by single-line telephone instruments, for example
loopback	A diagnostic test in which a signal is transmitted across a medium while the sending device waits for its return.

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LULT Line Unit Line Termination

LUNT Line Unit Network Termination

Management Information Base (MIB) A data base of objects, with attributes and values, representing the manageable components of a network device. Used in SNMP. There are industry standardized MIBs and proprietary MIBs

Media Access Control (MAC) The lower of the two sub-layers of the data link layer defined by the IEEE. The MAC sub-layer handles access to shared media, such as whether token passing or contention will be used. The MAC contains the standardized data link layer address that is required for every port or device that connects to a LAN. Other devices in the network use these addresses to locate specific ports in the network and to create and update routing tables and data structures. MAC addresses are 6 bytes long and are controlled by the IEEE.

Mean Time Between Failures (MTBF) This was an effort to establish a figure that gives an estimate of the reliability of a piece of equipment. The higher the MTBF rating, the longer the equipment should last.

megabyte (MB) A measurement of storage capacity equal to approximately 1 million bytes (1,048,576 bytes).

modem MOdulator-DEModulator, a device that takes digital computer signal, converts it to analog, and sends it across the phone line. Another modem on the reverse does the exact opposite action. Modems transfer data at different speeds or rates, called baud.

multiplexor A complex piece of telephone equipment which combines the data stream of several leased lines for transmission over a single higher bandwidth leased line. Multiplexors are used in the construction of WANs.

network A set of computers linked to one another for data sharing, or the link itself.

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Network Address Translation (NAT)	An Internet standard that enables a local-area network (LAN) to use one set of IP addresses for internal traffic and a second set of addresses for external traffic. A NAT box located where the LAN meets the Internet makes all necessary IP address translations.
OOS	Out of Service.
OCU-DP	Office Channel Unit, Data Port. A channel bank unit used to interface between the channel bank and a customer's DDS, DSU or DSU.
P-bit Coding Violation (PCV)	For all DS3 applications, a coding violation error event is a P-bit Parity Error event. A P-bit Parity Error event is the occurrence of a received P-bit code on the DS3 M-frame that is not identical to the corresponding locally-calculated code.
P-bit Errored Seconds (PES)	A PES is a second with one or more PCVs OR one or more Out of Frame defects OR a detected incoming AIS. This gauge is not incremented when UASs are counted.
P-bit Severely Errored Seconds (PSES)	A PSES is a second with 44 or more PCVs OR one or more Out of Frame defects OR a detected incoming AIS. This gauge is not incremented when UASs are counted.
packet	A unit of data sent across a network. When a large block of data is to be sent over a network, it is broken up into several packets, sent, and the reassembled at the other end. The exact layout of an individual packet is determined by the protocol and network architecture being used.
Packet InterNet Grouper (PING)	PING is a program used to test whether a particular network destination on the Internet is online (i.e. working) by repeatedly bouncing a "signal" off a specified address and seeing how long that signal takes to complete the round trip. No return signal - site is down or unreachable. Portion is returned - trouble with the connection.

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Password Authentication Protocol (PAP)
An authentication protocol that allows Point-to-Point Protocol peers to authenticate one another.

Peak Cell Rate (PCR)
The Peak Cell Rate, in cells/sec, is the cell rate which the source may never exceed.

PLAR
Private Line, Automatic Ringdown. A leased voice circuit that connects two single instruments together. When either handset is lifted, the other instrument automatically rings.

PMDL
Path Maintenance Data Link.

Point-to-Point Protocol (PPP)
Provides a standard means of encapsulating data packets sent over a single-channel WAN link. It is the standard WAN encapsulation protocol for the interoperability of bridges and routers.

port
A physical address that is associated with a physical connecting device.

protocol
Procedure or set of rules.

PVC
Permanent Virtual Circuit. A PVC is a permanent channel connection between two ATM devices. PVC's allow network transmissions to be started without having to first establish a connection with the end point ATM device. When a PVC is constructed, the end points of the connection will agree upon a path in which data will travel, and therefore agree upon the route that data will travel to reach its destination.

RIP
Routing Information Protocol. RIP is based on distance vector algorithms that measure the shortest path between two points on a network, based on the addresses of the originating and destination devices. The shortest path is determined by the number of "hops" between those points. Each router maintains a routing table, or routing database, of known addresses and routes; each router periodically broadcasts the contents of its table to neighboring routers in order that the entire network can maintain a synchronized database.

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robbed bit

A type of analog signaling that will occasionally steal information bits used for circuit signaling coding.

router

A computer or internet working device that directs traffic and moves packets between networks. A hardware architecture used in LANs, MANs, WANs, the Internet and Intranets. A device that connects any number of LANs. Routers use headers and a forwarding table to determine where packets go, and they use ICMP to communicate with each other and configure the best route between any two hosts.

signal

A generated electrical impulse that is a change in voltage to trigger an event.

Simple Network Management Protocol (SNMP)

SNMP is the most common method by which network managements applications can query a management agent using a supported MIB (Management Information Base). SNMP operates at the OSI application layer.

slot

As it applies to the Adit 600 is the position in the chassis for the controller, power supply or a service card (A, power or 1-6 for service cads).
As it applies to the Axxius 800 is the position in the chassis for the controller, power supply or a service card (A1, A2, P1, P2 or 1-8 for service cards).

span

A span is a logical name for an access port into the Access Bank II. A span carries Voice/Data information to/from the Access Bank.

Spanning Tree

Spanning Tree Protocol is a link management protocol that provides path redundancy while preventing undesirable loops in the network. For an Ethernet network to function properly, only one active path can exist between two stations.

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star network A star is a network topology that connects all devices to a central location called a hub. Traditional star networks are designed to be easily expandable because hubs can be connected to additional hubs of other networks. A star is the opposite of a ring network. Also see BUS network.

static In communications, interference (static) that destroys the integrity of signals on a line. Noise can come from a variety of sources, including radio waves, nearby electrical wires, lightning, and bad connections. One of the major advantages of fiber optic cables over metal cables is that they are much less susceptible to noise.

subnet mask 32-bit quantity indicating which bits in an IP address identify the physical network

subrate multiplexing The process of combining lower data rates into a single 64 Kbps channel signal.

subscriber line The telephone line connecting the local Telco CO to the customer's telephone instrument or telephone system.

switch In networks, a device that filters and forwards packets between LAN segments. Switches operate at the data link layer (layer 2) of the OSI Reference Model and therefore support any packet protocol. LANs that use switches to join segments are called switched LANs or, in the case of Ethernet networks, switched Ethernet LANs. See contact.

synchronous See asynchronous as an opposing technology. Data transmission using synchronization bytes, instead of start/stop bits, to control the transmission. In xDSL, video streams are considered to be synchronous in nature.

T1 Trunk Level 1. A digital transmission link with a total signaling speed of 1.544 Mbps. T1 is a standard for the digital transmission in North America

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TBOS	Telemetry Byte Oriented Serial. TBOS is an alarm monitoring and control prototype for telephone network equipment.
telnet	An Internet standard protocol that enables a computer to function as a terminal working from a remote computer.
TFTP	Trivial File Transfer Protocol.
Time Division Multiplexing (TDM)	TDM systems offer a synchronous transmission of data over a fixed bandwidth channel. The most popular TDM transports are a T1 (1.5 Mbps) transport and a T3 (45 Mbps) transport. This transmission medium is ideal for traffic requiring a CBR transport, such as voice.
traffic	The load of packets carried by a network or portion of a network. Heavy traffic slows down the response time of the individual packets.
Transmission Only (TO)	An operating mode on a 4-wire E&M card that provides dedicated one-way transmission paths to radio and modem equipment uncorrupted by the insertion of A/B robbed bit signaling.
trap	A mechanism permitting a device to automatically send an alarm for certain network events to a management station.
Trivial File Protocol (TFTP)	Trivial File Transfer Protocol. A simplified version of FTP that transfers files but does not provide password protection or user-directory capability.
trunk	A telephone communication path or channel between two points, one usually being a Central Office (CO).
trunk port	An input on a PABX or KSU that is used to interface the system with CO lines.
upload	To send a file from one computer to another via modem or other telecommunication method. Uploading is usually accomplished by FTP technology.

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V.90

The standard for full-duplex modems sending and receiving data across phone lines at up to 56,600 bps, approved by the International Telecommunication Union (ITU) in February, 1998.

VC MUX

Virtual Channel Multiplexer.

Voice Over IP (VoIP)

An emerging technology that is, voice delivered using the Internet Protocol, is a term used in IP telephony for a set of facilities for managing the delivery of voice information using the Internet Protocol (IP). In general, this means sending voice information in digital form in discrete packets rather than in the traditional circuit committed protocols of the public switched telephone network (PSTN). A major advantage of VOIP and Internet telephony is that it avoids the tolls charged by ordinary telephone service.

Wide Area Network (WAN)

A private long distance network that uses leased lines to connect computers or LANs. A wide area network is a linking of computers not physically attached through conventional network connectivity. Usually the WAN connection is a dedicated or high grade dial up phone link. It is often done with T1 or T3 connections but can also be through satellite or other technologies.

Wink

A signal sent between two telecommunications devices as part of a handshaking protocol. It is a momentary interruption in SF (Single Frequency) tone, indicating that the distant Central Office (CO) is ready to receive the digits that have just been dialed. In telephone switching systems, a single supervisory pulse.

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